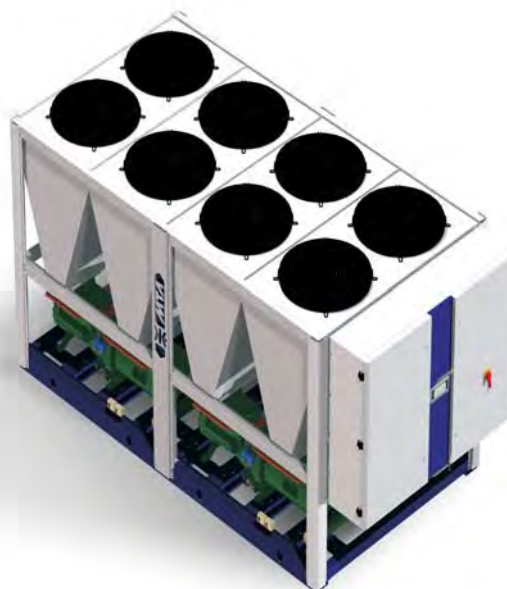


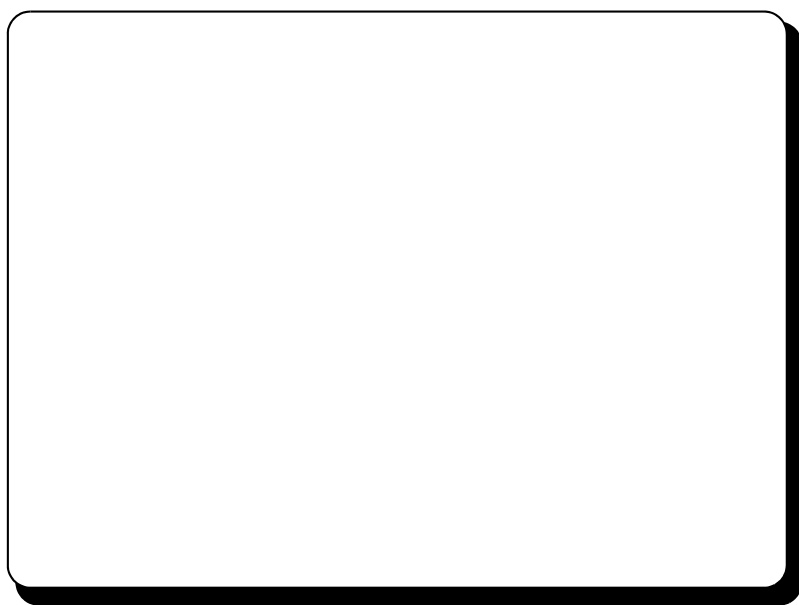
WATER REFRIGERATORS

PN P 160÷560



MANUALE DI ISTRUZIONE E MANUTENZIONE





INDEX

INDEX	1
GENERAL INFORMATION	3
1.1 Terminology.....	3
1.2 Symbols	3
1.3 How to interpret the model	4
1.4 How to interpret the code.....	4
1.5 Technical data	5
1.6 How to interpret the alphanumeric string-code	6
PERFORMANCES	7
SAFETY.....	9
3.1 General warnings	9
3.2 General precautions	9
3.2.1 Lifting and carriage precautions	9
3.2.2 Precautions during operation	9
3.2.3 Maintenance and repair precautions	10
3.3 Refrigerant gases.....	10
3.3.1 Refrigerant safety schedule	11
UNIT DESCRIPTION.....	13
4.1 Casing	13
4.2 Operating principle	13
4.3 Cooling circuit	13
4.3.1 Compressors	13
4.3.2 Condensers	14
4.3.3 Fans	14
4.3.4 Evaporator	14
INSTALLATION.....	15
5.1 Overall dimensions	15
5.2 Installation precautions	15
5.3 Positioning	16
5.4 Minimum distances from walls in the installation ambient	16
5.5 Noise reduction	17
5.6 Antivibration devices	17
PLUMBING CONNECTIONS.....	18
6.1 Liquids to be cooled.....	18
6.2 Hydraulic circuit connection.....	18
6.2.1 Hydraulic Flange connetion	18
6.2.2 Typical evaporator water piping connection	20
6.3 Antifreeze protection	20
ELECTRICAL CONNECTIONS	22
7.1 Electrical circuit.....	22
7.2 Electrical connections	22
7.3 Protection rating.....	22
UNIT OPERATIONS	23
8.1 Precautions during operation	23
8.2 Start up.....	23
8.3 Operation	24
ADJUSTMENT AND CONTROL	25
9.1 pCO terminal unit	25
9.1.1 Terminal buttons	25
9.1.2 Function of combined buttons	25
9.1.3 Terminal leds	26
9.2 Technical characteristics.....	26
9.3 pCO terminal display	26
9.3.1 Display/signalling masks	27

9.4	Unit start-up and stop	27
9.4.1	Automatic restart	27
9.5	Access to the programming	27
9.5.1	How to modify a parameter in "Free Menu"	28
9.5.2	How to modify a parameter of "Password Menu"	28
9.6	Main settings	29
9.6.1	How to set the language	29
9.6.2	How to modify the setpoint value	29
9.7	Setpoint management	30
9.8	Fixed set-point	30
9.9	Compensated set-point	30
9.10	Dual set-point	31
9.11	Time band variable set-point	31
9.12	Variable set-point from digital input (Multifunction)	31
9.13	Proportional Integral Derivative temperature regulation (PID)	31
9.14	Neutral Zone temperature regulation	31
9.15	Antifreeze control	32
9.16	Supervision System	32
9.17	Alarms signals	32
9.17.1	Alarms displaying	32
9.18	Alarms reset	32
9.19	Compressors management	33
9.20	Compressors unloading procedure	33
9.21	Compressor integral protection (PI)	33
9.22	Circulation pump	33
OTHER COMPONENTS		33
10.1	Electronic thermostatic valve (optional)	33
10.2	Forced ventilation of the electrical board	33
10.3	Antifreeze resistances with -20 function (optional)	33
10.4	High pressure switches (HP)	33
10.5	Pressure and temperature transducers	34
10.6	Function of transducers	34
10.7	Pressure transducers	35
10.8	Fan groups	35
10.8.1	Step Control	35
10.8.2	Variable speed control	36
10.9	Water differential pressure switch	36
CONDUCTION AND MAINTENANCE		37
11.1	Maintenance and repair precautions	37
11.2	Maintenance operations	37
11.2.1	Access to the inside electrical board of the machine	37
11.2.2	Emptying of the evaporator	38
11.2.3	Maintenance Schedule	38
TROUBLE SHOOTING		39
ALARMS MANAGEMENT		43
13.1	Alarms signals	43
13.1.1	Alarms displaying	43
13.2	Alarms reset	43
13.3	Alarms masks	43
HISTORIAL		56
SETTINGS TABLES		57

CHAPTER 1



GENERAL INFORMATION

1.1 Terminology

The machines described in this manual are called “WATER REFRIGERATORS” or simply “REFRIGERATORS”.

This manual is written for those responsible for the installation, use and maintenance of the refrigerator.

These refrigerators have been designed to cool a liquid flow.

In most applications, the liquid to be cooled is water and the term “WATER” will be used even if the liquid to be cooled is different from water (e.g. a mixture of water and ethylen-glycol).

The liquid to be cooled must be compatible with the materials used. This analysis must be made before purchasing or installing the refrigerator. Here below the term “PRESSURE” will be used to indicate the gauge pressure.

ATTENTION




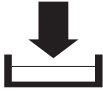

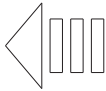



This manual provides the user, installer and maintenance technician with all the technical information required for installation, operation and carrying out routine maintenance operations to ensure long life.

If spare parts are required, this must be original. Requests for SPARE PARTS and for any INFORMATION concerning the unit must be sent to the distributor or to the nearest service centre, providing the MODEL and MACHINE NUMBER shown on the machine data plate and on the first page of this manual.



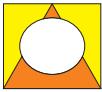
1.2 Symbols

The following symbols are shown on the stickers on the unit as well as on the overall dimension drawing and refrigeration circuits in this manual. Their meaning is the following:

	Machine water-inlet
	Machine water outlet
	Indications for lifting the unit
	Water drainage point from the machine
	Electrocution risk
	Cooling air flow
	Direction of the refrigerant gas flow and water circuit
	Rotation direction of the fans
	Risk of injury from sharp edges



Risk of burns from contact with high-temperature surfaces



Hole for inserting bars for lifting the machine

On the main page of the manual there is a metallic plate label with the following indications:

- unit model;
- alphanumeric string-code, to determine the unit characteristics;
- manual code;
- unit serial number;
- unit construction year.

1.3

How to interpret the model

MODEL	DESCRIPTION
<div><div>PN P</div><div>◇ ◇ ◇ / X X X</div><div><div></div><div></div><div></div></div></div>	
	Version of the unit (N, SN, SSN or HE)
	Motor nominal power expressed in HP*
	Phoenix model abbreviation

* Water inlet conditions 12°C, water outlet conditions 7°C, ambient air temperature of 35°C.

1.4

How to interpret the code

/N	Advisable for max. ambient temperatures between 44°C. (Indicative data: for exact values, which depend upon the unit model, please refer to the unit data plate and to the tables inside the technical catalogues).
/SN	Advisable for max. ambient temperatures between 40°C. (Indicative data: for exact values, which depend upon the unit model, please refer to the unit data plate and to the tables inside the technical catalogues). It is different from C version because the noise level is reduced.
/SSN	Advisable for max. ambient temperatures between 44°C. (Indicative data: for exact values, which depend upon the unit model, please refer to the unit data plate and to the tables inside the technical catalogues).
/HE	Advisable for max. ambient temperatures until 46°C. (Indicative data: for exact values, which depend upon the unit model, please refer to the unit data plate and to the tables inside the technical catalogues).

1.5 Technical data

The main technical data are given on the machine data plate.

MODEL and CODE	Identifies the size of the machine (see chap. "General information") and the type of construction which distinguishes it.
MANUAL	Code number of this manual.
SERIAL NUMBER	This is the construction number of the unit.
YEAR OF CONSTRUCTION	This is the year of the final test of the machine.
VOLTAGES/PHASES/ FREQUENCY	Power supply specifications.
MAX. CONSUMPTION I_{MAX}	This is electrical current consumed by the unit during the limit working conditions (refrigerant condensing temperature is 65°C = 149°F; refrigerant evaporating temperature is 12.5°C = 54°F vapour-dew).
INSTALLED POWER P_{MAX}	It is the power absorbed by the unit during the limit working conditions (refrigerant condensing temperature is 65°C = 149°F; refrigerant evaporating temperature is 12.5°C = 54°F vapour-dew).
PROTECTION RATING	As defined by the EN 60529 European standard.
REFRIGERANT	This is the refrigerant fluid in the unit.
COOLANT CHARGE	Quantity of coolant fluid in the entire system.
MAX. COOLING PRESSURE	This is the design pressure of the refrigeration circuit.
MAX. COOLING TEMP.	Design temperature of the cooling circuit.
COOLED FLUID USED	Fluid cooled by the machine (normally water).
MAX. WORKING PRESSURE	Maximum design pressure of the user circuit.
MAX. TEMPERATURE	Maximum design temperature of the user circuit, absolutely not to be confused with the maximum working temperature which is defined in the offer.
CONDENSER COOLING FLUID	Fluid used by the machine to cool the condenser (datum not given if the condenser is air-cooled).
MAX. WORKING PRESSURE	Maximum design pressure of the condenser cooling circuit (datum not given if the condenser is air-cooled).
MAX. TEMPERATURE	Maximum design temperature of the condenser cooling circuit (datum not given if the condenser is air-cooled).
SOUND PRESSURE LEVEL	This is the free field sound pressure level at 1 metre from the condenser side of the unit and at a height of 1.2 metres.
AMBIENT TEMPERATURE	Minimum and maximum value of the cooling air temperature.
WEIGHT	This is the approximate weight of the unit before packing.

On the wiring diagram you will find the following abbreviations (see first column in the above table):

I_M = max. electric current

I_{LR} = electric current with rotor stopped

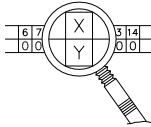
P_M = max. power

I_N = nominal electric current

I_C = nominal failure current

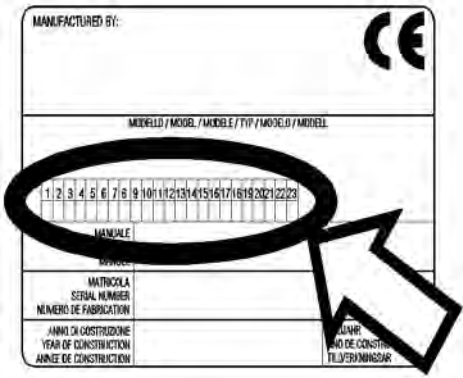
1.6 How to interpret the alphanumeric string-code

The alphanumeric string-code is reproduced on the metallic plate of the main page of the manual.



Illustrated on the side is marked symbol found on some parts of the refrigerant and wiring diagrams. Inside it is shown an enlarged part of the same alphanumeric string-code present on the manual.

The upper square indicates the position of the alphanumeric string-code, the lower square indicates the value assigned to that position.



At the left side is marked an example of an empty alphanumeric string-code. Each position will be defined by an alphanumeric value (0, 1, 2, A, B, etc.). Specific unit features are established by the position and the alphanumeric values.

Please find below each position’s alphanumeric values explained, which can be used:

	POS.	VALUE	DESCRIPTION
VERSION	1-2-3	N	N
		SN	SN
		SSN	SSN
		HE	HE
AMBIENT TEMPERATURE	4	0	STANDARD
		1	-20°C
ELECTRONIC THERMOSTATIC VALVE	5	0	NOT
		1	YES
FAN MANAGEMENT	6	1	ELECTRONIC SPEED REGULATION
		2	BY STEPS
COMPRESSOR PROTECTION	7	0	FUSES
		2	AUTOMATIC
COMPRESSOR SOUNDPROOFING	8	0	NOT PRESENT
		1	CASE
EVAPORATOR ANTIFREEZE PROTECTION	9	0	NOT
		1	YES
CONDENSER COIL PROTECTION	10	0	NOT PRESENT
		1	FILTERS
PRE-PAINTED CONDENSING COILS	11	0	NOT
		1	YES

CHAPTER 2

PERFORMANCES

ATTENTION

The refrigerator performance mainly depends on the flow and temperature of the cooled water and on the ambient temperature. These data are defined during the offer stage and it is to these that reference should be made.

The following table shows the cooling capacity nominal values expressed in kW for the various versions envisaged, at ambient air temperature of 35°C, inlet water conditions 12°C and outlet water conditions 7°C.

Version	N	SN	SSN	HE
	kW	kW	kW	kW
PN P 160	320	301	306	350
PN P 170	340	320	325	373
PN P 180	359	340	344	396
PN P 190	389	366	366	414
PN P 200	420	396	397	451
PN P 220	476	449	446	502
PN P 250	522	486	502	576
PN P 265	564	525	542	623
PN P 280	606	563	583	670
PN P 310	667	632	620	703
PN P 330	714	675	669	754
PN P 360	765	716	730	833
PN P 390	824	767	793	910
PN P 405	868	805	834	957
PN P 420	927	859	893	1011
PN P 440	980	923	919	1044
PN P 470	1007	943	958	1084
PN P 500	1039	969	995	1133
PN P 530	1148	1065	1099	1254
PN P 560	1233	1143	1166	1333





CHAPTER 3

SAFETY

This machinery was designed to be safe in the use for which it was planned provided that it is installed, started up and maintained in accordance with the instructions contained in this manual.

The manual must therefore be studied by all those who want to install, use or maintain the machinery.

The machine contains electrical components which operate at the line voltage, and also moving parts (e.g. fans).

It must therefore be isolated from the electricity supply network before being opened.

All maintenance operations which require access to the machinery must be carried out by expert or appropriately trained persons who have a perfect knowledge of the necessary precautions.

Avoid the presence of children in the unit installation place.

3.1 General warnings

When handling or maintaining the unit and all auxiliary equipment, the personnel must operate with care observing all instructions concerning health and safety at installation site.

Most accidents which occur during the operation and maintenance of the machinery are a result of failure to observe basic safety rules or precautions. An accident can often be avoided by recognising a situation that is potentially hazardous.

The user should make sure that all personnel concerned with operation and maintenance of the unit and all auxiliary equipment have **read and understood** all warnings, cautions, prohibitions and notes written in this manual as well as on the unit. Improper operation or maintenance of the unit and auxiliary equipment could be dangerous and result in an accident causing injury or death.

We cannot anticipate every possible circumstance which might represent a potential hazard.

The warnings in this manual are therefore not all-inclusive.

If the user employs an operating procedure, an item of equipment or a method of working which is not specifically recommended, he must ensure that the unit and auxiliary equipment will not be damaged or made unsafe and that there is no risk to persons or property.

Any incorrect or improper use of the machine by the user exempts the manufacturer from liability for any resulting damage to property and/or personal injury.

3.2 General precautions

3.2.1 Lifting and carriage precautions

Check all chains, hooks, shackles and slings are in good condition and are of the correct capacity (>4000daN).

They must be tested and approved according to local safety regulations.

Cables, chains or ropes must never be applied directly to lifting eyes.

Always use an appropriate shackle or hook properly positioned.

Arrange lifting cables so that there are no sharp bends.

Use a spreader bar to avoid side loads on hooks, eyes and shackles.

The lifting frame must be used only without wind.

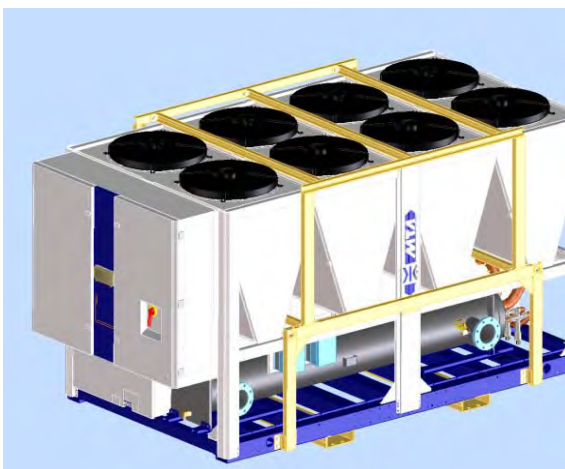
When a load is on a hoist stay clear of the danger area beneath and around it.

Keep lifting acceleration and speed within safe limits and never leave a load hanging on a hoist for longer than is necessary

Avoid fluctuations or pendulations of the load.

The lifting frame must be checked to assure the absence of wear or deformation signs. Verify the connections of the structure and the fixing screws.

The static test coefficient used is 1,5.



All unit models have different weights according to the model:

Please see Technical Catalogue or the data plate applied on the casing for weight data.

3.2.2 Precautions during operation

Operation must be carried out by competent personnel under a qualified supervisor.

All the connections to the cooling circuit, the wirings of the electrical plant and of the electrical board must be painted or clearly marked in accordance with local safety regulations in the place of installation.

Never remove or tamper with the safety devices, guards or insulation materials fitted to the unit or auxiliary equipment.

Safety

All electrical connections must comply with local codes.

The unit and auxiliary equipment must be earthen and protected by fuses against short-circuits and overloading.

When mains power is switched on, lethal voltages are present in the electrical circuits and extreme caution must be exercised whenever it is necessary to carry out any work on the electrical system.

3.2.3 Maintenance and repair precautions

ATTENTION

When disposing of parts and waste material of any kind make sure that there is no pollution of any drain or natural water-course and that no burning of waste takes place which could cause pollution of the air. Protect the environment by using only approved methods of disposal.

Keep a written record of all maintenance and repair work carried out on the unit and auxiliary equipment. The frequency and the nature of the work required over a period can reveal adverse operating conditions which should be corrected.

ATTENTION

Use only refrigerant gas specified on the specification plate of the unit.

Make sure that all instructions concerning operation and maintenance are strictly followed and that the complete unit, with all accessories and safety devices, is kept in good working order. The accuracy of pressure and temperature gauges must be regularly checked. They must be renewed when acceptable tolerances are exceeded.

ATTENTION

Do not weld or carry out any operation which produces heat near a system which contains oil or flammable liquids. The systems which may contain oil or flammable liquids must be completely drained and cleaned (with steam, for example), before carrying out these operations.

To prevent an increase in working temperature, inspect and clean heat exchanging surfaces (i.e. condenser fins) regularly. For every unit establish a suitable time schedule for cleaning operations.

Avoid to damage the safety valves and other pressure relief devices.

Avoid plugging by paint, oil or dirt accumulation.

ATTENTION

If replacement parts are needed use only original spares.

Before dismantling any part of the unit ensure that all heavy movable parts are secured.

When a repair has been completed, make sure no tools, loose parts or rags are left in, or on the machine.

ATTENTION

Check the direction of rotation of electric motors when starting up the unit initially and after any work on the electrical connections or switch gear.

All guards must be reinstated after carrying out repair or maintenance work.

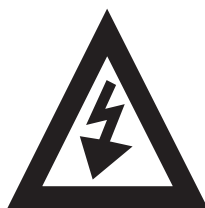
Do not use flammable liquid to clean any component during operation.

If chlorinated hydrocarbon non-flammable fluids are used for cleaning, safety precautions must be taken against any toxic vapours which may be released.

ATTENTION

Before removing any panels or dismantling any part of the unit, carry out the following operations:

- Isolate the unit from the main electrical power supply by disconnecting the cable from the electrical power source.
- Lock the isolator in the "OFF" position with a lock.
- Attach a warning label to the main isolator switch conveying: "WORK IN PROGRESS - DON NOT APPLY VOLTAGE".
- Do not switch on electrical power or attempt to start the unit if a warning label is attached.



3.3 Refrigerant gases

R134a is used as refrigerant in these units.

Never attempt to mix refrigerant gases.

PN P 160+560

To clean out a very heavily contaminated refrigerant system, e.g. after a refrigerant compressor burnout, a qualified refrigeration engineer must be consulted to carry out the task. The manufacturer's instructions and local safety regulations should always be observed when handling and storing high pressure gas cylinders.

3.3.1 Refrigerant safety schedule

R134a	
Denomination:	1,1,1,2 - tetrafluoroethane
INDICATION OF THE DANGERS	
Major dangers:	Asphyxia
Specific dangers:	Unknown
FIRST AID MEASURES	
General information:	Do not give anything to unconscious persons.
Inhalation:	Take the person outdoors. Use oxygen or artificial respiration if necessary. Do not administer adrenaline or similar substances.
Contact with the eyes:	Thoroughly wash with plenty of water for at least 15 minutes and call a doctor.
Contact with the skin:	Wash immediately with plenty of water. Remove contaminated clothing immediately.
FIRE-FIGHTING MEASURES	
Means of extinction:	Any means.
Specific dangers:	Pressure increase.
Specific methods:	Cool the containers with water sprays.
MEASURES IN THE EVENT OF ACCIDENTAL LEAKAGE	
Individual precautions:	Evacuate personnel to safe areas. Provide adequate ventilation. Use means of personal protection.
Environmental precautions:	Evaporates.
Cleaning methods:	Evaporates.
HANDLING AND STORAGE	
Handling technical measures/ precautions:	Only use in well-aired premises.
recommendations for safe use:	tightness test. Do not carry out any pressure tests with air/R134a mixtures. It can form a combustible mixture with the air at pressures above atmospheric pressure when the ratio in volume exceeds 60%.
Storage	Close properly and store in a cool, dry well-ventilated place.
CONTROL OF EXPOSURE/INDIVIDUAL PROTECTION	
Control parameters:	1000 ppm v/v or ml/m ³ = 3540 mg/m ³ as weighted average over 8 hours.
Respiratory protection:	For rescue and maintenance work in tanks, use autonomous breathing apparatus. The vapours are heavier than air and can cause suffocation, reducing the oxygen available for breathing.
Protection of the eyes:	Safety goggles.
Protection of the hands:	Rubber gloves.
Hygiene measures:	Do not smoke.
PHYSICAL AND CHEMICAL PROPERTIES	
Colour:	Colourless.
Odour:	Similar to ether.
Boiling point:	-26.5 °C at atm. press.
Flammability point:	Non flammable.
Relative density:	1.21 kg/l at 25°C
Solubility in water:	0,15% in weight (25 °C - atm. press.)
STABILITY AND REACTIVITY	
Stability:	No reactivity if used with the relative instructions.
Materials to avoid:	Alkaline metal, earthy alkaline metals, granulated metals salts, Al, Zn, Be, etc. in powder.
Hazardous decomposition products:	Halogen acids, traces of carbonyl halides.
TOXICOLOGICAL INFORMATION	
Acute toxicity:	ALC/inhalation /4 hours/lab. rats = 567 ml/l.
Local effects:	Concentrations substantially above 1000 ppm v/v can cause narcotic effects. Inhalation of products in decomposition can lead to respiratory difficulty (pulmonary oedema).
Long-term toxicity:	Has not shown any cancerogenic, teratogenic or mutagenic effects in experiments on animals.
ECOLOGICAL INFORMATION	
Global warming potential HGWP (R11=1):	0.28
Ozone depletion potential ODP (R11=1):	0
CONSIDERATIONS ON DISPOSAL	
Usable with reconditioning.	



CHAPTER 4



UNIT DESCRIPTION

4.1 Casing

The casing is built with galvanised panels and painted with polyester resins.

4.2 Operating principle

All the refrigerators described in this manual work on the basis of the same principle.

The cooling circuit is composed of two or four distinct and independent circuits which cool a water flow thanks to the use of a single pipe-bundle evaporator in which the cooling fluid is evaporated on the pipe side and the liquid to be cooled flows on the plating side.

The cooling compressors are controlled by an electronic control board which controls:

- the evaporator water inlet temperature to maintain it within the preset limits;
- the evaporator water outlet temperature to maintain it within the preset limits and the pressure difference between the evaporator water inlet and outlet to eliminate the risk of freezing caused by zero flow.

4.3 Cooling circuit

See enclosures

There are two or four distinct cooling circuits, each of which can be overridden in the event of failure.

The refrigerant in the gaseous state is compressed by the compressor and sent to the condenser. Here the gas condenses, exchanging heat with the ambient air. It exits in a liquid state. It passes the cock and the dryer filter. After passing the flow indicator, the liquid is laminated by the thermostat valve and enters the evaporator. Here it exchanges heat with the water circuit as it evaporates. Having returned to the gaseous state, it is sucked in by the compressor/s and the cycle is repeated.

Each circuit is furnished with the following components:

- high and low pressure transducers for each circuit
- refrigerant interception cock on the liquid pipeline, installed after the condenser;
- drier filters;
- solenoid valve on the liquid pipeline:
A with thermostatic valve: always present
B with traditional thermostatic valve: always present except for circuits with 125 and 140 HP compressor, which have PHT thermostatic valves with solenoid valves on equalizing and pilot pipelines;
- flow indicator;
- expansion thermostatic valve with external equaliser;
- double series of pressure switches to control the max. condensing pressure, as defined by European standard (EN378);
- safety valves on high and low pressure circuit (as defined by EN378).

All connections of components are welded with silver alloy and the copper tubes are covered with thermal insulating material in the cold parts to avoid the condensate formation.

Only for SSN versions

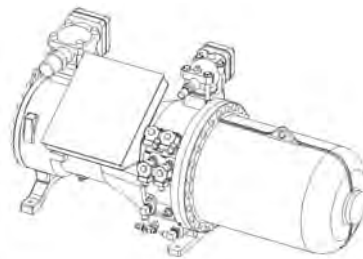
These units are furnished with silencers and flexible tubes on compressor outlet and inlet. The compressors are mounted on antivibration supports, different according to the weight distribution.

4.3.1 Compressors

The compressors used are of the screw and semi-hermetic type.

They are provided with integral protection against excessive temperatures in the electric motor windings, casing resistance, oil sensor, temperature probe on the refrigerant outlet pipeline, inlet and outlet cocks, non-return valve on the outlet pipeline.

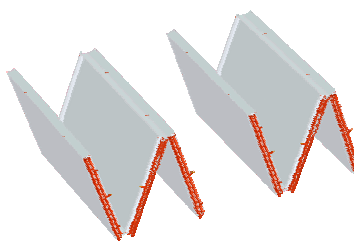
The electric power supply is three-phase of 50 Hz.



If requested they could be furnished with soundproofing casing of compressors. The soundproofing casing is always furnished in silenced versions because acoustic insulation material is applied to guarantee the reduction of noises. Compressors have Part Winding start-up.

4.3.2 Condensers

The condensers are heat exchangers of the fin pack type and are cooled by the air flow produced by several fans. They are fin pack coils formed of tubes (scored inside in order to increase the thermal exchange), copper collectors, turbolenced fins, sheet or aluminium shoulders. The condensing coils could have pre-painted fins (option).



Condenser air filters (optional)

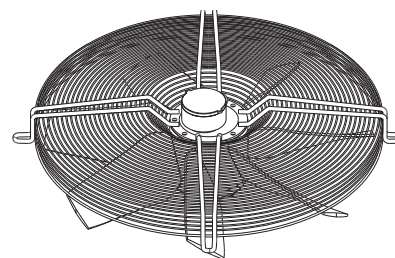
If requested, the machines should be supplied with air filters in galvanised sheet and aluminium. They can be installed on a second moment (Kit).

ATTENTION

If filters are not supplied, the client must provide a zone to prevent not-authorised persons to approach the machine.

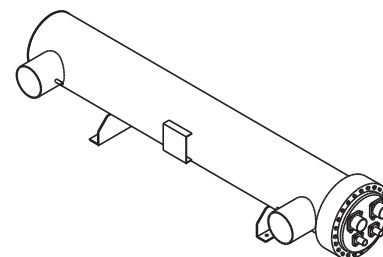
4.3.3 Fans

The fans used are of the axial type. They are controlled by a pressure transducer which stops them when the condensation pressure decreases below a preset value. In these units are used 6/8-pole fans, the silenced versions have lower rotation speed to obtain lower overall noise. The protection rating is IP54 with "F" insulation class. The speed regulation function allows to reduce the fan rotation speed. The condensing pressure control is obtained by the capacity reduction of fans, by means of pCO. The fan regulation can be by steps.



4.3.4 Evaporator

The evaporators are of the shell and tube direct expansion type. These components are composed of a bundle of copper tubes formed in a "U" shape, mechanically expanded at the ends into a tube plate and housed inside a carbon steel shell. All evaporators feature 2, 3 or 4 independent refrigerant circuits and one water circuit. The refrigerant fluid flows inside the copper tubes, while the water, which is oriented by baffles, flows over the outside of the tubes. The shell features an external insulating and anticondensation cladding. All the units are equipped with a water differential pressure switch to protect the evaporator in the event of an interruption of the water flow. All the evaporators utilised can handle antifreeze solutions and, more generally, all other liquids provided they are compatible with the materials of which the hydraulic circuit is composed. It is provided with a cock to facilitate the discharge of the water contained in it when you want to drain the plant (see chap. " [Conduction and maintenance](#) ").



Each bundled evaporator will be protected from ice formation by means of an electrical resistance (option) controlled by the control panel.

ATTENTION

The flow rate of the fluid on the plating side must not exceed the values specified in the table in chapter " [Installation](#) ".

CHAPTER 5

INSTALLATION

ATTENTION

Before carrying out the installation or operating on this machine, ensure that all the personnel has read and understood the " Safety" chapter in this manual.

5.1 Overall dimensions

N°	Model	Height	Width	Lenght N/SN	Lenght SSN/HE
1	PN P 160	2360	2190	4480	4480
2	PN P 170	2360	2190	4480	4480
3	PN P 180	2360	2190	4480	4480
4	PN P 190	2360	2190	4480	5470
5	PN P 200	2360	2190	4480	5470
6	PN P 220	2360	2190	4480	6460
7	PN P 250	2360	2190	4480	6460
8	PN P 265	2360	2190	4480	6460
9	PN P 280	2360	2190	4480	6460
10	PN P 310	2360	2190	6460	8440
11	PN P 330	2360	2190	6460	9430
12	PN P 360	2360	2190	6460	9430
13	PN P 390	2360	2190	6460	9430
14	PN P 405	2360	2190	6460	9430
15	PN P 420	2360	2190	6460	9430
16	PN P 440	2360	2190	8440	11410
17	PN P 470	2360	2190	8440	11410
18	PN P 500	2360	2190	8440	11410
19	PN P 530	2360	2190	8440	11410
20	PN P 560	2360	2190	8440	11410

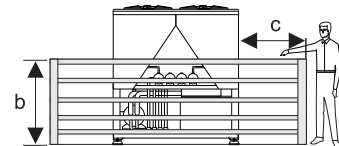
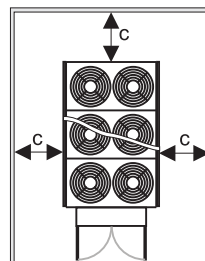
5.2 Installation precautions

Installation work must be carried out by competent personnel under a qualified supervisor.



In machines without protection filters for the finned coils, a no-go area must be established around the condensing coils because of the danger from the sharp edges of the fins.

c | 1100 | 900 | 800 | 500
b | 1400 | 1600 | 1800 | 2000



The electrical supply line of the unit must be protected by equipment chosen and installed by the user as described in the wiring diagram as well as in the paragraph " Electrical connections". If the refrigerator is connected to a closed-type hydraulic circuit fitted with an automatic filling system, and the pressure of the filling system exceeds the maximum working pressure of the refrigerator, it is necessary to install a pressure reduction device (e.g. a safety valve which operates at a pressure lower than the maximum working pressure of the machine, and located close to the input connection). All the piping of the cooled water must be painted or clearly marked in compliance with the local safety in force in the installation place. Manual on-off valves should be provided for the refrigerator so that the hydraulic circuit can be by-passed to carry out maintenance.

ATTENTION

All the electrical connections must comply with the local prescriptions in the installation place. The machine and the auxiliary apparatus must be earthen and protected against short-circuits and overloading.

If raised platforms are required to provide access to the unit they must not interfere with normal operation or obstruct access for lifting or dismantling components. Platforms and stairs should be of grid or plate construction with safety rails on all open sides.

5.3 Positioning

1. The refrigerator may be installed both outdoors and indoors.
2. If installed indoors, the room must be well ventilated. In some cases it may be necessary to install fans or extractors to limit the temperature of the room.
3. The ambient air must be clean and not contain flammable gas or solvents.
4. The minimum and maximum working ambient temperature are specified on the unit data plate. In extreme temperature conditions, the protection devices may trip.
5. The machine can be positioned on any flat surface capable of supporting its weight.
6. Leave a sufficient space around the unit (about 1.5 metres) to permit access during service operations (see also enclosures).
7. Do not obstruct or disturb the cooling air flow of the condenser. The air must enter the machine through the finned coils of the condensers to be expelled to the exterior through the fans. Position the refrigerator in such a way that the cooling air cannot recirculate in the intake grilles. Ensure that the refrigerator is not subject to warm air from the cooling systems of other machines.

ATTENTION

In machines without condenser filters, the sharp edges of the aluminium fins constitute an element of risk.

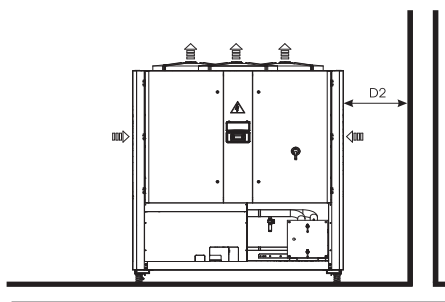
Render the area in which these machines are installed inaccessible to unauthorised personnel or cordon off a no-go area as described in the chapter " Safety" of this manual.

5.4 Minimum distances from walls in the installation ambient

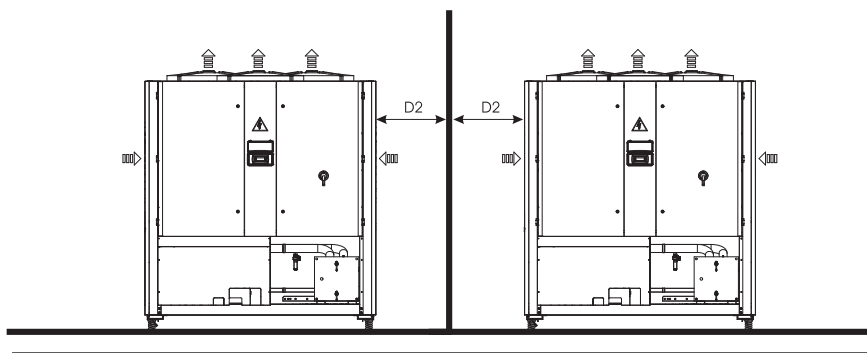
See enclosures

For easy access to units during servicing, please follow these indications:

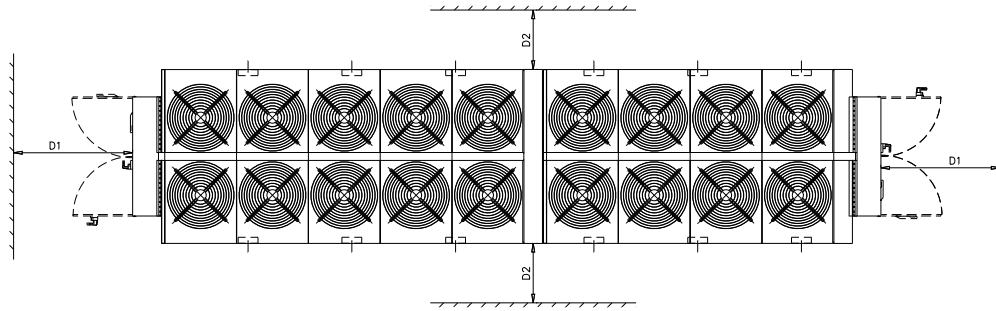
Install unit with a minimum distance (D2) between the condenser surface and any walls, as in the illustration on the side.



When two units are placed side by side, it is important to keep enough distance between them; as in the illustration on the side.



For any other type of installation, please provide a minimum area around the unit, as in the illustration on the side.



D1 and D2 distances depend on the type of unit.

Please note: consult the overall dimensional drawings annexed to the unit.

5.5 Noise reduction

Locate the unit away from noise sensitive areas.

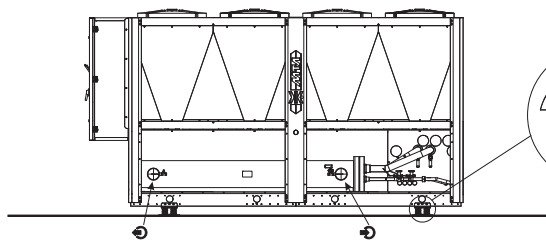
Avoid locations near windows or between structures where normal operating noises may cause problems.

Reduce noise transmitted by installation structures by isolating water lines, by using electrical conduits, and also by isolating the unit itself.

ADDITIONAL METHODS TO REDUCE NOISE LEVELS: Use wall sleeves and rubber isolated piping hangers to reduce the noise transmitted by water or due to vibrations transmitted by the pump.

Also, spring isolators are effective in reducing the low frequency noise generated by reciprocating compressors and for generally isolating the unit from noise sensitive areas.

5.6 Antivibration devices



Antivibration devices are recommended for all roof installations or wherever there are problems of vibration transmission. For further information see Overall Dimension Drawings here annexed.

PLUMBING CONNECTIONS

6.1 Liquids to be cooled

The liquids to be cooled must be compatible with the materials used.

These can be water or mixtures of water and glycol, for example.

The addition of anti-corrosive chemical additives and operating in a pH range between 7 and 8 is recommended.

Even in the case of glycol mixtures, the use of appropriate chemical additives (consult the glycol supplier) is very important to protect the refrigerator materials from possible corrosion caused by the chemical degradation to which glycol is subject.

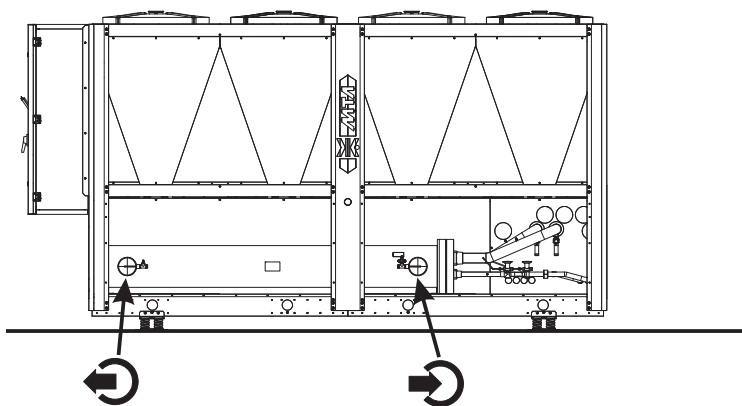
The use of chemical additives is necessary when the refrigerator is part of an hydraulic circuit opened in at least one side to the atmosphere. In this case, in fact, the continuous supply of oxygen facilitates possible corrosive reactions inside the refrigerator. The liquids to be cooled must not be flammable.

ATTENTION

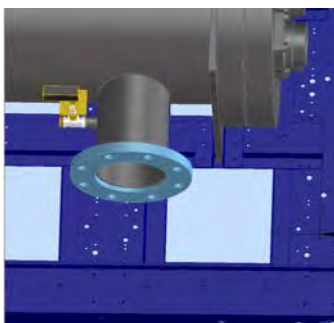
The liquids to be cooled contains dangerous substances (e.g. ethylene glycol), it is necessary to collect any liquid which leaks because it could cause damages to the ambient.

Furthermore, when the refrigerator will not be used for a long period, dangerous liquids must be disposed of by firms specialised and authorised for treating them.

6.2 Hydraulic circuit connection



6.2.1 Hydraulic Flange connection



The hydraulic system must be dimensioned so that water doesn't flow in the machine with pressures higher than data plate values and with nominal flows equal to those indicated in the table below:

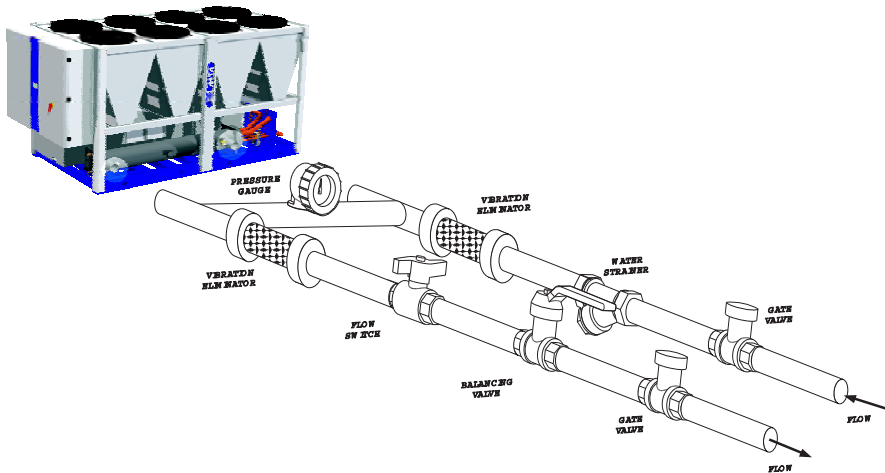
Unit model	Nominal flow*	Max. flow	Min. flow	Water contents
	[m ³ /h]	[m ³ /h]	[m ³ /h]	[dm ³]
PN P 160	55	72.8	29.5	113.5
PN P 170	58	72.8	29.5	113.5
PN P 180	62	72.8	29.5	113.5
PN P 190	67	127.6	39	161.7
PN P 200	72	127.6	47	184.4
PN P 220	82	127.6	47	184.4
PN P 250	89	127.6	43	222.2
PN P 265	97	127.6	43	222.2
PN P 280	104	127.6	43	222.2
PN P 310	114	157.6	65	295
PN P 330	122	157.6	65	295
PN P 360	131	193.1	63	462
PN P 390	141	193.1	63	462
PN P 405	149	193.1	63	462
PN P 420	159	193.1	60	423
PN P 440	168	193.1	60	423
PN P 470	173	200	86	406
PN P 500	178	200	86	406
PN P 530	197	220	78	475
PN P 560	211	220	78	475

* Water inlet conditions 12°C, water outlet conditions 7°C, ambient air temperature of 35°C.

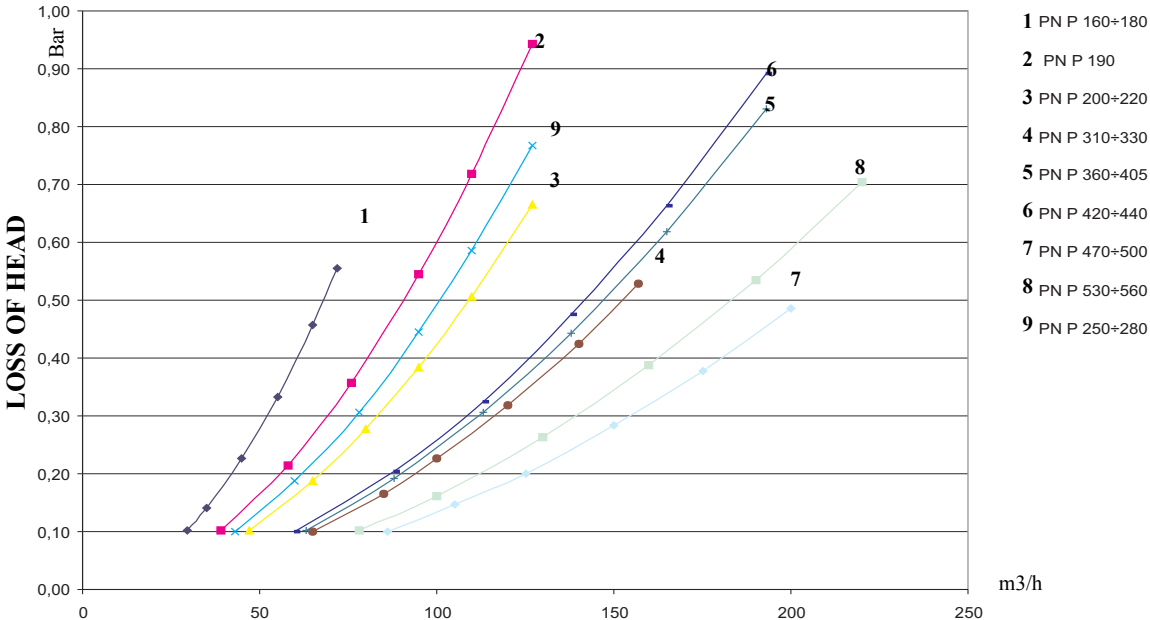
To reduce the amplitude of oscillations of the chilled water temperature, the installation of a tank is recommended. The table below states the minimum water content in a system under normal operation conditions.

Model	PN P 160	PN P 170	PN P 180	PN P 190	PN P 200	PN P 220	PN P 250	PN P 265	PN P 280	PN P 310
Storage volume [m ³]	2,9	3,0	3,2	3,5	3,8	4,3	4,7	5,1	5,4	4,1
Model	PN P 330	PN P 360	PN P 390	PN P 405	PN P 420	PN P 440	PN P 470	PN P 500	PN P 530	PN P 560
Storage volume [m ³]	4,3	4,7	5,0	5,3	5,6	4,2	4,3	4,5	4,9	5,3

6.2.2 Typical evaporator water piping connection



The water flow rate through the evaporator changes according to the unit model and must be between the minimum and maximum values shown in the evaporator pressure drop table below.
Avoid varying the water flow rate through the evaporator while compressor(s) is/are operating.



Additional technical data can be found in the Technical Catalogue.

6.3 Antifreeze protection

ATTENTION

The unit operates with water outlet temperature between -10 ÷15°C.

Even if the minimum working ambient temperature is above 0°C it is possible for the refrigerator - during stoppages in the cold seasons - to find itself in an environment with a temperature below 0°C. In these cases, if the refrigerator is not emptied, antifreeze (ethylene glycol) must be added in the following percentages to prevent the formation of ice:

Min. ambient temp. [°C]	Ethylene glycol [% in volume]
<0	10
-5	15
-10	20
-15	30
-20	35

Depending on the cooled water outlet temperature, antifreeze (ethylene glycol) must be added in the following percentages to prevent the formation of ice:

Min. water outlet temperature [°C]	Ethylene glycol [% in volume]
<5	15
0	20
-5	25
-10	35
-15	40
-20	45

Additional technical data can be found in the Technical Catalogue.

ATTENTION

When the temperature is lower than or equal to 3°C is necessary to add ethylene glycol.



ELECTRICAL CONNECTIONS

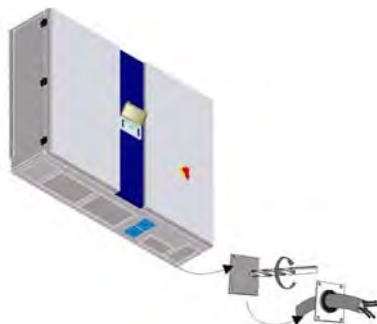
7.1 Electrical circuit

See the enclosed wiring diagrams.

7.2 Electrical connections

Check that the power supply voltage and frequency match the requirements of the unit as shown on the unit data plate and within the tolerances given in the wiring diagram.

Ensure that the electrical installation complies with local wiring and safety regulations.



For the entry of the electrical cables into the machine, used the provided plates as suggested in the drawing below.

To check that the machine is correctly connected to the power supply, see chapter "8.2 Start up".

At the beginning of the power cable:

1. it must be guaranteed a protection from the direct contacts with a protection rating of IP2X or IPXXB at least;

2. It must be installed a safety device which:

prevents short-circuiting or overloading of the supply and all other unprotected cables of the plant; (refer to the information indicated on the wiring diagram)

limits the 15 kA peak short circuit current to its own nominal cut-off power when the short circuit current at the operation point is higher than 10 kA effective;

protects against indirect contacts on the unit, such as short-circuiting between the phase and protection circuit, by cutting off the supply automatically (see IEC 364 - HD 384, CEI 64-8); To do this use a differential switch (with cut-in nominal differential power of 0.03 A)

protects against phase failure where the electrical supply is three-phase.

For dimensioning the protection circuit, reference should be made to all the data specified in the wiring diagram (max. absorption, pickup currents, cable section).

ATTENTION

In the event of failure of one cooling circuit it must be cut off electrically to run the machine with the other circuit only.

To cut off one or other cooling circuit separately, use the switches in the power board (see annexed wiring plan).

7.3 Protection rating

The protection rating of the whole machine is **IP54**.

CHAPTER 8



UNIT OPERATIONS

8.1 Precautions during operation

Operation must be carried out by competent personnel under a qualified supervisor.

Never remove or tamper with the safety devices, guards or insulation materials fitted to the unit or auxiliary equipment.

When main switch is turned on, lethal voltages are present in the electrical circuits and extreme caution must be exercised whenever it is necessary to carry out any work on the electrical system.





The first time the machine is started after several days' stoppage, turn on the casing resistance of every compressor at least 4 hours before pressing the ON/OFF button (see "8.2 Start up").

Do not exceed the liquid flow to be cooled specified in chapter "Installation".



8.2 Start up

ATTENTION

Before starting up these units be sure that all personnel have read and understood the "Safety" section of this manual.

1. Check that the machine's on/off valves are open.
2. If the hydraulic circuit is of the closed type, check that an expansion tank has been installed with an adequate capacity.
3. Check that the ambient temperature is within the limits indicated on the machine data plate.
4. Check that the main switch is in the OFF position ("O").
5. Check that the power supply voltage is correct.
6. Power the machine by means of the supply line protection device.
7. Turn the machine main switch ON ("I"). LED buttons on the control panel indicate that the machine is powered.
8. Models without pump: check that water flows through the evaporator.
9. Check that the outlet cocks of the compressors are open.
10. Press the  +  button on the board. **The pump, if installed, starts immediately.** After the delay set on the electronic board **the cooling compressors can start.** The first time the machine is started after several days' stoppage, turn the main switch to the ON position ("I") and wait at least 4 hours before starting the machine by means of the ON/OFF ( + ) button on the board.



To switch off press  +  buttons again.

11. Check that the rotation direction of the pump, if present, is correct. If not, stop the machine and invert two phases in the supply terminals of the power board. Check that the fan rotation direction is correct (if a pump has been installed and its rotation direction is correct, the fan rotation direction should also be correct). The cooling air must enter the refrigerators from the finned coils of the condensers. If necessary, invert two phases to reverse the rotation direction.
12. **The unit is now ready to work.**
13. **If with the first start-up**, there is a high ambient temperature and the temperature of the water in the hydraulic circuit is much higher than the working value (e.g. 25-30°C) this means that the refrigerator starts up overloaded with the consequence of possible protection device tripping. To reduce this overload, a refrigerator outlet valve can be **gradually** (but not totally!) **closed to reduce the flow of water passing through it**. Open the valve as the water temperature in the hydraulic circuit reaches the working value.

8.3 Operation

The machine operates in completely automatic mode.

It is not necessary to turn it off when there is no thermal load as it turns off automatically when the preset water-inlet temperature is reached.

ATTENTION

Never exceed the water flow values specified in the table in chapter "Installation".

Never turn off the water circuit circulation pump before turning off the machine.

Units without pump: before turning on the machine turn on the circulation pump.

ADJUSTMENT AND CONTROL

9.1 pCO terminal unit



9.1.1 Terminal buttons



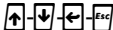
The functions of pGD1 terminal buttons are explained here below:

pGD1 buttons	Function
	If pressed once it is utilized to check if in the pCO there is any alarm on. After removing the alarm cause, a second pressure of this button resets the signalling.
	If pressed once it allows to enter DIRECT loop. If pressed for more than 5" it allows to enter the configuration modality (password needed).
	Utilized to return from the various menus to the main displaying mask.
or	Utilized to scroll the various masks of a loop when the cursor is in HOME position. Utilized to increase or decrease the value of a numeric field (configuration). Utilized to scroll the various sub-sections of a mask. It allows to scroll the list of sub-sections of a loop. If pressed during unit normal operation or when unit is in stand-by, it shows the programme version, the programme code, the BIOS and BOOT versions and the mask with the indication of unit status.
	Utilized to move the cursor on the various adjustable fields of a mask. It allows the access to the selected programming sub-section. Sometimes it is used to confirm the operation.

9.1.2 Function of combined buttons

pGD1 buttons	Function
+	When the unit is on, if pressed together they switch on and off the unit.
+	When the unit is on, if pressed together they access the masks of other units (only when modular function is enabled).
+ +	When the unit is on, keep pressed + buttons and press many times button to increase the contrast.
+ +	When the unit is on, keep pressed + buttons and press many times button to decrease the contrast.
+ +	When the unit is on, if pressed together they are utilized to address the pGD1/network.

9.1.3 Terminal leds

pGD1 Led	Function
	On when the menu loop is displayed, with or without password.
	On when an alarm is present.
	On when the terminal is powered.

9.2 Technical characteristics

The electronic control allows to:

- **regulate the evaporator water inlet/outlet temperature with proportional logic, neutral zone or PID;**
- check and display the evaporator water inlet and outlet temperatures;
- check and display the evaporating and condensing pressures;
- manage the automatic rotation of the compressors starting sequences (when there are more compressors) to reduce the working time of each compressor;
- set the weekly programming;
- display more than 135 alarm messages, as:
 - condensing high pressure alarm;
 - evaporating low pressure alarm;
 - antifreeze alarm on the evaporator water outlet;
 - compressor and eventual pump damaged alarm;
 - the water that flows through the evaporator is not enough;
 - water inlet/outlet high temperature alarm;
 - the refrigerator and the single compressor have exceeded the programmed number of working hours before maintenance;
 - minimum/maximum rating alarm, phase sequence not correct and rating lack of balance that exceeds the set value.

If enabled, the control enables interaction of units of the same type via the pLAN network. This case is known as a modular system where a Master unit manages other Slave units.


A contact is available to remote the signalling of a general alarm. It is also available an outlet with proportional signal to control the inverter pump.

9.3 pCO terminal display

The pCO terminal display is used to show information concerning unit status and to change the values of programmable parameters.

The top left corner of the display represents the cursor HOME position.

The MAIN mask is displayed the first time the electronic controller is switched on.

To return to the main mask during pCO programming, simply press button  as many times as necessary.

NOTE

If no operations are carried out for 5 minutes the unit returns automatically to the MAIN mask.

The contents of the display are shown in "Fig. 1 Main mask":

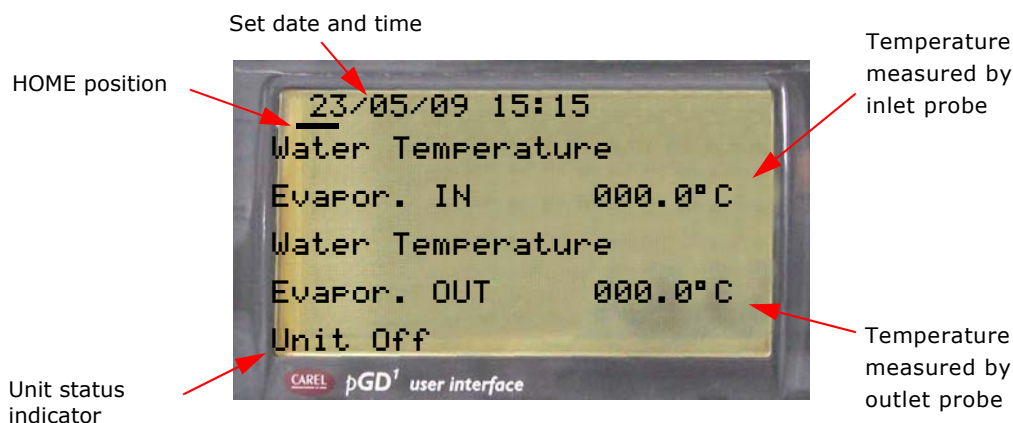
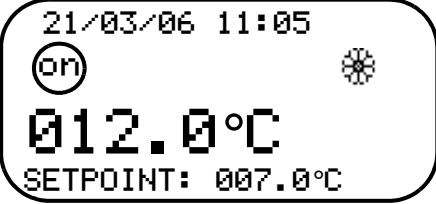

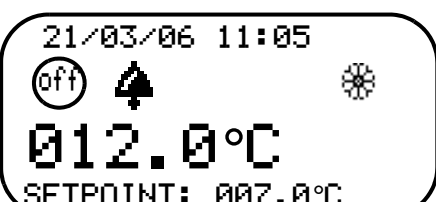




Fig. 1 MAIN MASK





9.3.1 Display/signalling masks

In addition to the main mask described above, the electronic controller also offers a series of display or signalling masks. These masks are displayed after a period of transition during which no button of the pGD1 is pressed.

	<p>This mask will be displayed after 10 minutes in which no pGD1 buttons are pressed. This mask shows date, time and unit ON status at the top left; the bottom left of the mask shows the temperature control value, set-point, and current time.</p>
	<p>This mask, which is similar to the previous one, appears with the unit is OFF.</p>
	<p>This mask, similar to the previous one, is displayed when an alarm trips (the bell symbol flashes). Press button  to display the relative alarm (see Chapter 19 "Alarms management").</p>
	<p>The screensaver mask will be displayed after approximately 20 minutes in which no pGD1 buttons are pressed.</p>



9.4 Unit start-up and stop

When the installation and electrical connections have been carried out, operate on the unit general switch-breaker (on the electrical panel) putting it in ON position.



The terminal unit is correctly **connected to the power supply line** when the LED of the buttons , ,  and  light up.
After the net has stabilized, the main mask will appear.

NOTE

Every time the unit is switched on by means of the main switch-breaker, it is recommended to leave the unit in STAND-BY for any second to allow the pCO net to stabilize.

Press the buttons  +  of the pGD1 terminal to switch on the unit and consequently start the setting procedure.

When the unit is on it will displayed the message "Unit On".

To switch off the unit press  +  buttons on pGD1 terminal.



The unit will switch off and the message "Unit Off" will be displayed.

9.4.1 Automatic restart

If the electrical supply is cut-off, when the power returns the machine starts in ON, if the mode was ON and remains in OFF, if the mode was OFF (function to be enabled).



9.5 Access to the programming

The electronic control is furnished with two main menus:




1. FREE menu (PASSWORD NOT needed) see ["9.5.1 How to modify a parameter in "Free Menu"'"](#)
It can be accessed by pressing and releasing .
2. PASSWORD menu (PASSWORD needed) see ["9.5.2 How to modify a parameter of "Password Menu"'"](#)
It can be accessed by pressing and releasing for 5 sec. .

9.5.1 How to modify a parameter in “Free Menu”









1. Press and release I on the terminal to access the loop mask (**free menu**):

2. It is possible to scroll the different loops using  or  button on the terminal.




```
i/o
SET-POINT
user
```

3. After selecting the desired loop (e.g. “User”) press  to access the mask of this loop (HOME position).
It will be possible to scroll the masks using  or  button.

```
set-point
USER
i/o
```


4. Find the parameter that has to be modified, press  to move the cursor on the first parameter of the displayed mask.
5. Modify the value using  or .
6. Press again the button  to confirm the value.
If in the mask there is more than one parameter the cursor will move to the following one and, when the last one is reached, the cursor will return to HOME position.
7. To move to another mask of the loop press  or , when the cursor is in HOME position.
To access a new loop press once the button  and it will be possible to go back to the loop mask.
8. To go back to the MAIN mask press twice  button on the terminal.



9.5.2 How to modify a parameter in “Password Menu”

1. Enable the password menu pressing for 5 sec. the button  on the terminal;
2. The password is required;
3. Insert the correct password using  or  on the terminal;

```
Insert
Password:

000000
```

4. Press the button  again to confirm the password.

5. If the password is wrong, the message “>>WRONG
PASSWORD<<” will appear, it will be necessary to insert it again.
If the password is right, the various scrolling loops will be accessed;
It is possible to scroll the loops using  or  button on the terminal.
The loops will be displayed in groups of three.

```
unit config.
modularity
DRIVER
worked hours
manual function
compressors
fans
condensing valve
unloading
recovery
freecooling
pumps
alarms
antifreeze
clock
historicals
supervisor
special functions
other settings
```

- Find the desired loop (e.g. "worked hours") press to access the mask of the loop (HOME position).
To scroll the masks use or .

driver
WORKED HOURS
manual function
compressorS

ATTENTION

The access to the loops depends on the password.

- Follow the same procedure described on paragraph "9.5.1 How to modify a parameter in "Free Menu"" from point 4. to point 8.

ATTENTION

All the parameter masks are grouped by LOOP they belong to and are joined to an alpha-numeric reference.

english

9.6 Main settings

9.6.1 How to set the language

The pCO allows to choose the language of the masks.

The available languages are: Italian, English, German, French and Spanish.

- To access "User" loop follow the same procedure described in chapter "9.5.1 How to modify a parameter in "Free Menu"".

set-point
USER
i/o

- Press or to reach the mask with the languages;
- Press : the cursor starts flashing under the current language;
- Choose the language using the button or .
- Press to confirm the language;
The display automatically returns to show the main mask translated on the language selected and, consequently, also all the other masks.

Language	US001
Used:	English

ATTENTION

Each unit is delivered ready to work, therefore all the control parameters have been already set during the testing operation and it isn't necessary to modify them.

On particular cases it is possible to modify the set point values by following the instruction indicated below.


9.6.2 How to modify the setpoint value

- Follow the same procedure described in chapter "9.5.1 How to modify a parameter in "Free Menu"".
- Select the Set-Point loop and press on the terminal.

i/o
SET-POINT
user





- The first mask of the loop Setpoint will be visualized, press the button or to visualize the mask displayed on the side;

Setpoint	SP002
Summer	000.0 C
Second Setpoint	
Summer	000.0 C

4. Press  on the terminal:
the cursor will go to the field “Summer Setpoint”.

NOTE
The second setpoint will be visualized only if it has been enabled.

Setpoint	SP002
Summer	<u>000.0</u> C
Second Setpoint	
Summer	000.0 C

5. Use the button  or  to change the value;
6. Press  to store the new value;
7. Press twice the button  to go back to the Main mask.

ATTENTION
Modify the SETPOINT only if necessary, making sure that they are neither too low nor too high.



DANGER
A Summer Setpoint which is too low may cause ice formation so that antifreeze must be added.
Generally the differential values must not be too low.
If the differential value must be modified, consider also the delays for compressor starts and stops.

9.7 Setpoint management

The pCO electronic control can manage the setpoint in five different ways:

- fixed setpoint;
- compensated setpoint;
- double setpoint;
- adjustable setpoint by daily bands;
- setpoint by analogue input.

9.8 Fixed set-point

The pCO controller manages water temperature control according to a fixed set-point and differential that cannot be altered by external agents or actions.

9.9 Compensated set-point

The compensated set-point is measured on the basis of the ambient air temperature detected by probe (-BAT1) and the values of the “Set-Point Summer Compensation” and “Maximum Compensation Value” parameters. The following diagram shows the set-point trend on the basis of the various parameter settings: Diagram with positive “Compensation Differential”;

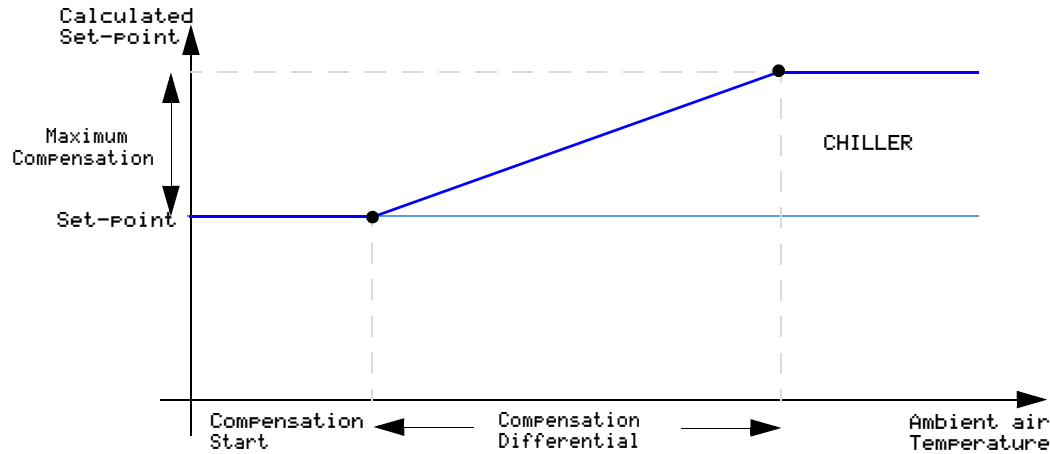
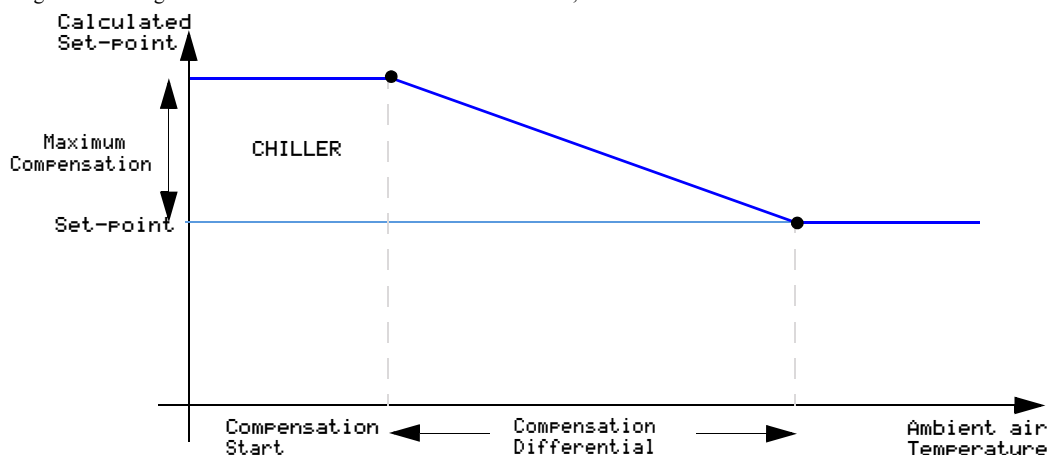


Diagram with negative "Compensation Differential";



9.10 Dual set-point

A second operating set-point can be programmed, with selection between the two set-points performed by switching the electronic board digital input (see electrical diagram).

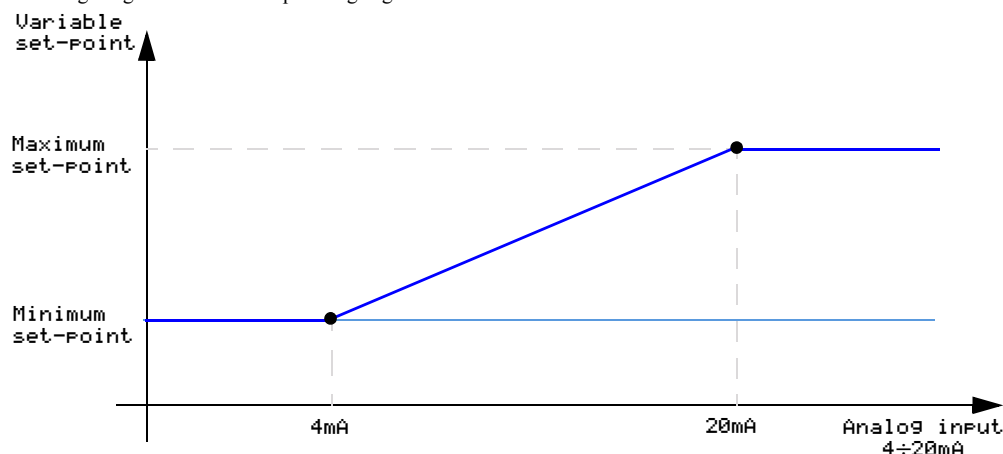
9.11 Time band variable set-point

With time-band variable set-point operation four time-bands can be programmed with different set-points. Once the programmed time has been reached, the controller changes the unit set-point according to the value programmed for the time-band in question.

9.12 Variable set-point from digital input (Multifunction)

The set-point is variable in accordance with the temperature value detected by a probe set as "analog input 4÷20mA".

The following diagram shows the operating logic:



9.13 Proportional Integral Derivative temperature regulation (PID)

The P+I+D temperature regulation considers:

- the difference between the temperature value detected by the probe and the preset value: **Proportional value P**.
- the time during which the temperature value remains stable through the **Integral Error I**;
- the speed of the using water temperature variation through the **Derivative D** value.

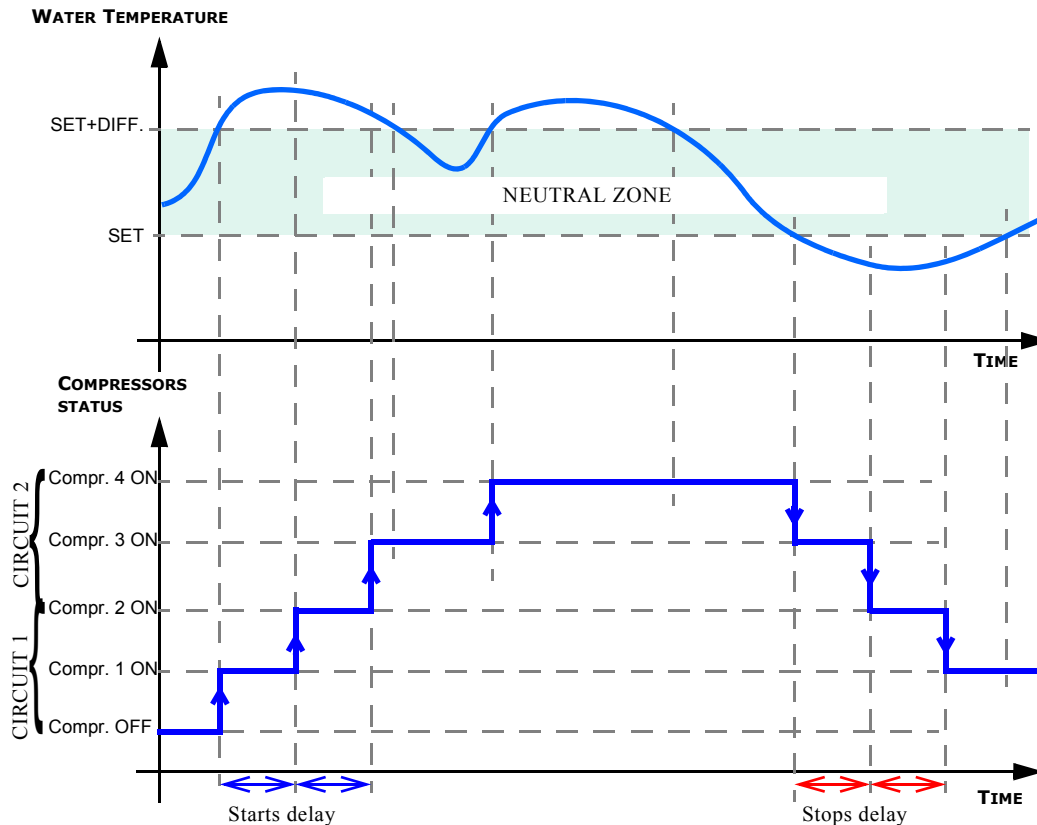
The addition of these parameters generates the **Temperature Regulation Variable**, and according to it the compressor are switched on or off.

9.14 Neutral Zone temperature regulation

When the temperature measured by the probe will be lower than the setpoint value (so under the Neutral Zone) it will be required the stopping of one or more compressors (the compressors consecutive stopping will be done with a pre-fixed delay time) until the temperature measured will return within the limits of the Neutral Zone.

When the temperature measured by the probe will be higher than the setpoint + differential value (so above the Neutral Zone), it will be required the starting of one or more compressors (the compressors consecutive starting will be done with a pre-fixed delay time) until the temperature measured will return within the limits of the Neutral Zone.

The graphic of the Neutral Zone Logic explains how the increasing or decreasing requirement of “cold” fixes the compressors starting or stopping, following the logic of the Neutral Zone.



9.15 Antifreeze control

The anti-freeze control depends on the temperature measured at the evaporator outlet (-BEWOT probe).

When the temperature decreases below the preset antifreeze threshold the pCO will produce an alarm which will block the unit.

It will persist until the temperature increases and reaches a value higher than setpoint + differential.

9.16 Supervision System

The pCO can manage the following supervision protocols:


- CAREL
- MODBUS
- GSM
- DIRECT MODEM (Rs 232)
- LONWORKS

9.17 Alarms signals

9.17.1 Alarms displaying




During unit operation, some alarm conditions could happen. Depending on their danger they could be controlled by pCO by means of a simple signal or by means of the partial / complete block of the unit.


When an alarm occurs, on the pCO display appears “ENABLED ALARM” and the red led of the button  lights up.

Press the button  on the terminal to visualize the alarm mask, consisting of 2 alarm LOOPS:

- Unit alarms,
- Driver alarms;

On the right corner it will be visualized the number of active alarm.

Press  to move the cursor in the desired LOOP, then use the button  or  on the terminal to scroll the other alarm messages.

The alarm loops are enabled only if there is an alarm. They are enabled when the loop indication is in capital letters and the symbol  is displayed.


```
N Active Alarms: 000
Unit Alarms
Driver Alarms
```


Use the alarm list to identify the alarm displayed and to have more information (see paragraph "13.3 Alarms masks").

9.18 Alarms reset

When the alarm cause has been resolved, if it was of automatic reset type the unit will automatically return to normal operation.

If the alarm was of manual reset type, press  button for more times until reaching the reset.

The message “No Alarm Active” will appear on the display if the button  is pressed without any alarm on.

To return to the main mask press  button.

9.19 Compressors management

The compressors are started-up with Part-Winding logic.

There are other function for compressors management:

- Compressors capacity control according to the thermal request
- Proportional Integral Derivative control (PID) and Neutral Zone
- Step Less compressors control, by means of relays it increases or decreases the compressor power
- Compressors rotation, in order to maintain all compressors with the same number of working hours
- Pump-down, it controls the stopping of compressors in order to avoid the presence of liquid at compressor suction.

9.20 Compressors unloading procedure

One or more capacity control steps are disabled, reducing the condenser thermal power. They are enabled when the max. ambient temperature is reached or when the condenser thermal power is too high caused by the water inlet temperature too high.



9.21 Compressor integral protection (PI)



This protection consists of three or six thermostatic sensors, each sunk in the winding of one motor phase; they are connected together in series and their terminals are taken to the outside.

This system ensures complete protection against most of the problems which can give rise to burning of the windings.

When it trips, it is necessary to find and eliminate the cause; then it is necessary to energize and de-energize the unit operating on the circuit breaker.

9.22 Circulation pump

When the machine is turned on by means of   buttons the pump starts.

When the machine is turned off by means of   buttons it remains on for the preset delay. The pump stops only when some alarms trip.

CHAPTER 10



OTHER COMPONENTS

10.1 Electronic thermostatic valve (optional)

The units can be furnished with electronic thermostatic valves.

The electronic thermostatic valve is controlled by the electronic board (DRIVER) which manages the informations sent by the pressure and temperature transducers.

The electronic board allows to control the overheating and to optimize the unit capacity.

To verify the type of valve installed see the alpha-numeric string code.

10.2 Forced ventilation of the electrical board

The circulation fan trips when the temperature in the electrical board exceeds about 40°C. The units working with a temperature of -20 °C are equipped with heating resistances, which are installed inside the electronic board in order to protect its components. With the option -20 the fan is activated in tandem with the anti-freeze resistances.

10.3 Antifreeze resistances with -20 function (optional)

Antifreeze resistance kits are option furnished, in alternative to the glycol. They protect the water circuit from ice formation with ambient temperatures until -20°C. These resistances can be installed only if the fan electronic adjustment is enabled. Not present on HE versions.

10.4 High pressure switches (HP)

They assure a supplementary protection of electromechanical type in addition to the protection furnished by the *p*CO transducers.

They are installed to monitor the refrigerant compressor discharge pressure and prevents it increasing to levels dangerous to the operation of the unit and people within the vicinity.

- Each unit is furnished with one "Safety" high pressure switch of "manual reset" type.
When it trips, it opens the compressor supply circuit (see wiring diagram).
Then, when the compressor delivery pressure drops below the reset point, it must be manually re-armed and it is possible to start the machine again by means of the ALARM button of the electronic control.
- Each unit is furnished with a high pressure switch "Type Approved", associated to each compressor of the refrigerant circuit. It is of "automatic reset" type.
When it trips, it opens the compressor supply circuit (see wiring diagram).
Then, when the compressor delivery pressure drops below the reset point, it automatically re-arms and it is possible to start the machine again by means of the ALARM button of the electronic control.

The pressure switches HP should be screwed to the cooling circuit piping using a SCHRAEDER valve (with needle) which prevent leakage during the pressure switch replacement.

For a correct operation of the unit it is recommended that the reset values of the pressure switches are the ones indicated in the table below:

COMPONENT	REFRIGERANT	TRIP			RESET		
		bar	°C	°F	bar	°C	°F
HP-Safety High pressure switch	R134a	18.5	66.4		14.5	56.5	
HP Type Approved High pressure switch	R134a	18	65.4		13	52.4	

10.5 Pressure and temperature transducers

The units are furnished with two types of transducers:

- pressure transducers, directly powered by the electronic control
- temperature transducers, of Negative Temperature Coefficient (NTC) resistive type

10.6 Function of transducers

Pressure transducers (P) and temperature transducers (T) are connected to specific inputs on the pCO board.

Each connected transducer has a specific function and is identified with letter **B** and a number.

This table identifies transducer types and indicates their function.

TRANSDUCER	-BHP1	-BHP3	-BEWIT	-BEWOT1	-BEWOT2	-BLP1	-BLP3	-BAT1	-BDT1	-BDT3
BOARD	MASTER									
connected to analog input	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
TRANSDUCER FUNCTION	P	P	T	T	T	P	P	T	T	T
EVAPORATOR WATER INLET			X							
EVAPORATOR WATER OUTLET				X	X					
TANK WATER OUTLET										
HIGH PRESSURE	X(1)	X(3)								
LOW PRESSURE						X(1)	X(3)			
PUMP-DOWN						X(1)	X(3)			
UNLOADING	X(1)	X(3)	X							
STEP CONTROL FANS	X(1)	X(3)								
SPEED CONTROL FANS	X(1)	X(3)								
ANTI-FREEZE ALARM				X	X					
AMBIENT TEMPERATURE								X		
COMPRESSOR DISCHARGE TEMPERATURE									X	X
TRANSDUCER	-BHP2	-BHP4	-BAT2		-BEWOT	-BLP2	-BLP4		-BDT2	-BDT4
BOARD	SLAVE									
connected to analog input	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10
TRANSDUCER FUNCTION	P	P	T		P	P	P		P	P
EVAPORATOR WATER INLET			X							
EVAPORATOR WATER OUTLET					X					
TANK WATER OUTLET					X					
HIGH PRESSURE	X(2)	X(4)								
LOW PRESSURE						X(2)	X(4)			
PUMP-DOWN						X(2)	X(4)			
UNLOADING	X(2)	X(4)								
STEP CONTROL FANS	X(2)	X(4)								
SPEED CONTROL FANS	X(2)	X(4)								
ANTI-FREEZE ALARM										
AMBIENT TEMPERATURE			X							
COMPRESSOR DISCHARGE TEMPERATURE									X	X

Table 1 USING THE TRANSDUCERS

- (1)USED ONLY FOR READINGS RELATIVE TO CIRCUIT 1 OPERATION
 (2)USED ONLY FOR READINGS RELATIVE TO CIRCUIT 2 OPERATION
 (3)USED ONLY FOR READINGS RELATIVE TO CIRCUIT 3 OPERATION
 (4)USED ONLY FOR READINGS RELATIVE TO CIRCUIT 4 OPERATION

ATTENTION

The number of transducers connected to the board depends on the type of unit and is established in design phase.

10.7 Pressure transducers

The units are equipped with an high and low pressure transducer for each cooling circuit. Through the compressors inlet/outlet pressure value they manage the unit operation according to the pressure setpoint value set in the pCO. Through the parameter measurement, it is possible to control, for each circuit, the following functions:

- high pressure alarm;
- low pressure alarm;
- unloading for high pressure;
- pump-down for low pressure (not enabled);
- fan management;
- high and low pressure value measurement.

If the pressure of one circuit is higher or lower than the preset value an alarm could trip and stop the unit, the fans start up/switch off, one or more compressors stop with a variable delay.

10.8 Fan groups

The high pressure transducers connected to the pCO board can be used to manage the fans in three ways:

- by **Step Control**
- by **Speed Control**
- by **Speed Medium Control**

10.8.1 Step Control

The pCO activates step control of the fans on the basis of the pressure values measured by the high pressure transducers on the refrigerant circuit pipes. Condensation control is provided by two steps for each group. The activation of one fans step corresponds to starting of one subgroup composed of several fans. The fans of each refrigerant circuit are started in groups in such a way as to achieve gradual connection with several steps on the basis of the condensing pressure. "Fig. 2 Fans step activation logic" describes the operating logic of 2-step control:

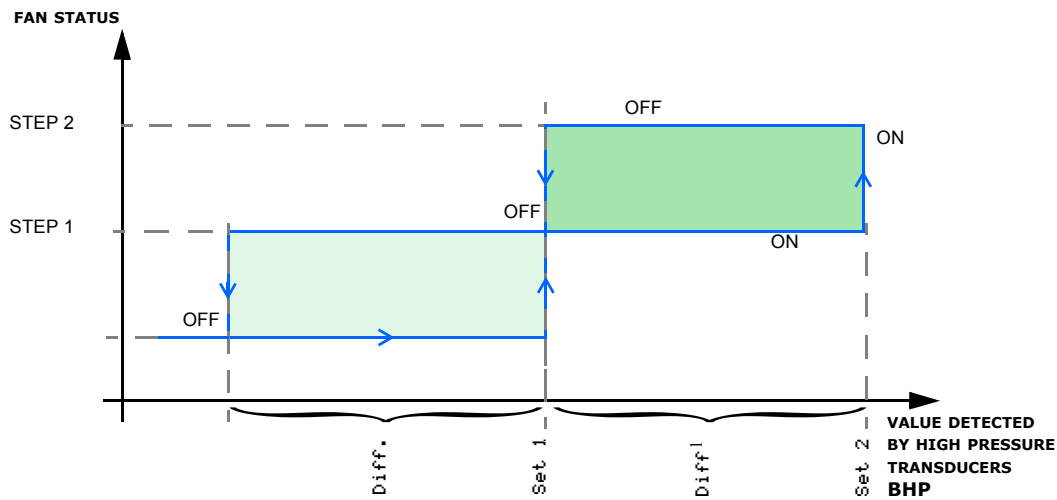


Fig. 2 FANS STEP ACTIVATION LOGIC

In the event of step regulation, the fans of each circuit are progressively started-up, according to the condensation pressure.

<div> <div>QE</div> <div> <div>1 2 3</div> <div>7 8 9</div> <div>circuit 1</div> <div>circuit 2</div> <div>4 5 6</div> <div>10 11 12</div> </div> </div>	<p>Fan step management logic: the first fans to start are 1-2-3, then 7-8-9, 4-5-6 and, at the end, 10-11-12. In every circuit all coils must work at the same time.</p>
<div> <div>QE</div> <div> <div>5 6</div> <div>3 4</div> <div>circuit 1</div> <div>circuit 2</div> <div>1 2</div> </div> </div>	<p>Logic of fan activation in step mode: fans 1-2 are started first, followed by fans 3-5 and 4-6.</p>

10.8.2 Variable speed control

Fan speed can be modulated using a phase cut-off regulator controlled by the pCO.

On the units each group of fans can work at a different speed according to the pressure value detected by the corresponding pressure transducer (-BHP transducers).

In normal operation the fans are stopped when pressure read by the high pressure transducers (-BHP) is lower than the set-point value, or when the last compressor is stopped.

"Fig. 3 Fans activation logic with speed control" describes the operating logic of the fan speed control system.

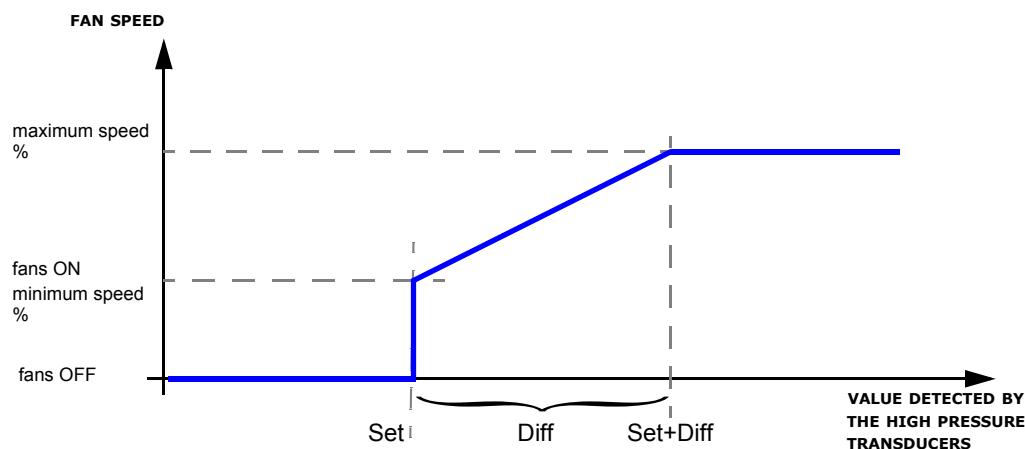


Fig. 3 FANS ACTIVATION LOGIC WITH SPEED CONTROL

10.9 Water differential pressure switch

The machine is provided with a differential pressure switch which measures the water pressure difference between the inlet and outlet manifold of the evaporator. When the pressure switch measures a Δp lower than 50 mbar (250 mmH₂O), it sends an alarm signal to the board which stops the machine after the preset delay. When the Δp returns above 50 mbar it is possible to restart the machine pressing ALARM button. It is necessary that this situation is isolated and limited in the time.

CHAPTER 11

CONDUCTION AND MAINTENANCE

11.1 Maintenance and repair precautions

Maintenance, overhaul and repair work must be carried out by competent personnel under a qualified supervisor.

The non-insulated surfaces of the components of the cooling circuits inside the compressor compartment can be at very high temperatures when the machine is in operation and for some minutes after it is turned off.



11.2 Maintenance operations

ATTENTION

Before proceeding with the installation and maintenance of these units be sure that all personnel concerned have read and understood the "Safety" chapter of this manual.

These units will give many years of trouble-free service if they are properly maintained and serviced.

Because there are sharp edges in the rear and internal compartment that can cut and harm, the maintenance technicians must take care to protect themselves from accidental contact with these edges during work inside the compartment.

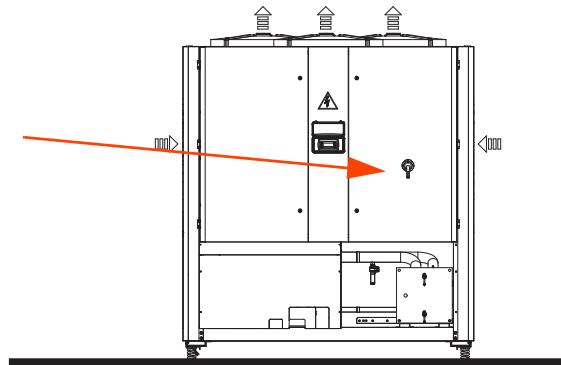


11.2.1 Access to the inside electrical board of the machine

ATTENTION

The access to the electronic board is allowed only if the unit is off.

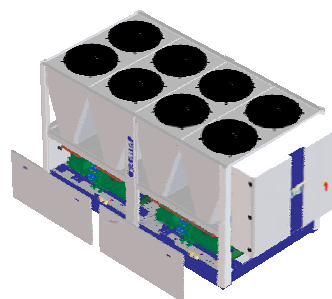
To gain access to the components of the electrical board, turn the main switch/circuit breaker to the open "O" position and open the closing bolts with the provided key.



For models with panels to the compressor compartment:

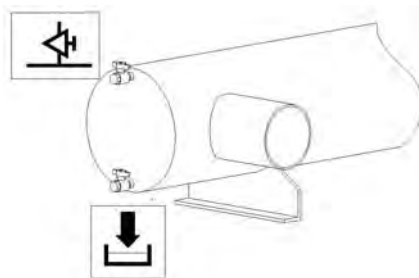
Remove the bottom side panels using a screwdriver to remove the screws.

Given the presence of sharp and cutting edges in the rear and internal compartment, the maintenance technician must protect himself from accidental contact during work inside the compartment.



11.2.2 Emptying of the evaporator

There is a cock at the rear of the evaporator to be used for draining it. This operation is necessary when the machine is stopped and it has no antifreeze resistance, and the ambient temperature reaches the freezing point of the water.



11.2.3 Maintenance Schedule

OPERATION	1 day	1 month	6 months	annually
Check control panel display for any alarm signals.	◇			
Check that the water outlet temperature is within the envisaged range.	◇			
Check that the water inlet temperature is lower than the value used for selecting the refrigerator.		◇		
Check that the difference between the pump output pressure (if installed) and intake pressure (measured by a pressure gauge with the pump stopped) is within the limits envisaged and, in particular, is not lower than the value corresponding to the maximum flow.		◇		
Check that the liquid indicator is full or with a small stream of bubbles when the compressor is running.			◇	
Check that the unit current absorption is within the data plate values.			◇	
Carry out visual inspection of refrigerant circuit, looking out for any deterioration of the piping or any traces of oil which might indicate a refrigerant leak.			◇	
Check the condition and security of piping connections.			◇	
Check the condition and security of wiring and electrical connections.			◇	
Using a spanner, check that the connections to the refrigerant compressor have not slackened.			◇	
Check that the ambient air temperature is lower than the value used for selecting the refrigerator. Check that the environment is well ventilated.		◇		
Check that every fan is turned on automatically. Check that fan operation is not noisy. Thoroughly clean the fins of the condenser with soft brush and/or jet of clean compressed air. Check that the grilles of the unit are free from dirt and any other obstructions.			◇	
Clean condenser fins with a mild detergent.				◇

IMPORTANT:

- This plan is based on an average working situation.
- In some installations it may be necessary to increase the frequency of maintenance.

CHAPTER 12



TROUBLE SHOOTING

PROBLEM	CAUSE	SYMPTOM	REMEDY
A Water outlet temperature BEWOT higher than the expected value.	A1 Water flow too high.	A1.1 Difference between BEWIT and BEWOT lower than 5°C with both circuits on.	Increase the pressure drop in the water circuit (e.g.: by partially closing a pump outlet cock).
	A2 Thermal load too high (water flow) x (input temperature - water outlet) = Thermal load.	A2.1 <ul style="list-style-type: none"> Temperature BEWOT greater than expected value; alarm high water outlet temperature trips. 	Restore the thermal load to within the preset limits.
	A3 Ambient temperature too high.	A3.1 See A2.1	Restore the ambient temperature to within the preset limits.
	A4 Condenser fins dirty.	A4.1 See A2.1	Clean the condenser fins.
	A5 Front surface of the condenser obstructed.	A5.1 See A2.1	Free the front surface of the condenser.
	A6 The fans rotate in the wrong direction.	A6.1 See A2.1	Invert the position of 2 of the 3 power supply phases.
	A7 No refrigerant fluid in the plant.	A7.1 <ul style="list-style-type: none"> See A2.1; low evaporation pressure; a lot of bubbles in the liquid indicator. 	Get a refrigerator technician to check for leaks and eliminate them. Fill the plant.
B Low pressure drop (water pressure) at the pump outlet (if installed).	B1 Water flow too high. Wrong working of the pump (high flow, low discharge head, high absorption).	B1.1 <ul style="list-style-type: none"> Possible increase in the outlet temperature BEWOT (see A2.1); with pump installed on the machine: pressure difference, read on the machine pressure gauge, too low with pump stopped and pump running. 	Reduce water flow within design limits, for example by partially closing a pump outlet cock.
	B2 See point C . Before ice obstructs the whole evaporator, there is an increase in the pressure drop.	B2.1 See point C .	See point C .
	B3 Evaporator obstructed because of dirt transported by the water to be cooled.	B3.1 High water temperature difference between inlet and outlet.	Depending on the type of dirt: <ul style="list-style-type: none"> clean the evaporator by running a detergent solution which is not aggressive for steel and copper; run a high water flow against the stream. Install a filter upstream from the refrigerator.
C The refrigerator is obstructed and the water doesn't flow.	C1 Set point too low so that the water freezes.	C1.1 <ul style="list-style-type: none"> Water doesn't flow; the water differential pressure switch alarm trips; intake pressure too low. 	Choose between: <ul style="list-style-type: none"> raise the set point; add an appropriate % of ethylene glycol (antifreeze) (see "Installation"). ⚠ The formation of ice can irretrievably damage the refrigerator.

PROBLEM	CAUSE	SYMPTOM	REMEDY
D High pressure switch or the high pressure alarm trips.	D1 One or more fans do not work.	D1.1 <ul style="list-style-type: none"> • See problem; • refrigerant compressor stops; • ALARM led lights on; • main alarm relay tripped. 	Repair or replace the fan. Verify the heat protection of the fan/s.
	D2 Ambient air temperature too high.	D2.1 <ul style="list-style-type: none"> • Ambient air temperature higher than maximum permitted value; • see D1.1. 	Reduce ambient temperature within design limits, for example by increasing local ventilation. Press ALARM button to run the unit.
	D3 Recirculation of warm air due to incorrect installation location.	D3.1 <ul style="list-style-type: none"> • Condenser cooling air temperature higher than the permitted value; • see D1.1. 	Change the position of the unit or the position of any adjacent obstructions to avoid recirculation. Press ALARM button to run the unit.
	D4 See A4 .	D4.1 See D1.1 .	Clean the condenser fins. Press ALARM button to run the unit.
	D5 See A5 .	D5.1 See D1.1 .	Remove obstruction from the frontal side of the condenser. Press ALARM button to run the unit.
	D6 Ambient temperature high combined with incorrect fan rotation.	D6.1 <ul style="list-style-type: none"> • The fan blows air across the condenser coil instead of drawing it across; • refrigerant compressor stops. 	Invert the position of two phases of the power supply to the fan (see chap. " 8.2 Start up ").
	D7 Thermal load = (water flow) x (inlet temperature - water outlet) too high.	D7.1 <ul style="list-style-type: none"> • Water outlet temperature too high; • refrigerant compressor stops; • main alarm relay tripped. 	Reduce the thermal load to within preset limits. Press ALARM button to run the unit.
E Low pressure switch or low pressure alarm trips.	E1 No refrigerant fluid in the plant (see also A7).	E1.1 <ul style="list-style-type: none"> • Refrigerant compressor stops; • main alarm relay tripped. 	Call a qualified refrigeration engineer to check for leaks and replenish refrigerant charge.
F Compressor overload alarm trips.	F1 Thermal load = (water flow) x (inlet temperature - water outlet) too high in combination with high ambient temperature.	F1.1 <ul style="list-style-type: none"> • See problem; • main alarm relay tripped; • refrigerant compressor stops. 	Check that the temperature of the cooled water and of the ambient air are within the preset limits (see chap. " Performances "). Restore the load within the preset limits. Wait a few minutes before turning on again.
	F2 Thermal load = (water flow) x (inlet temperature - water outlet) too high combined with a shortage of refrigerant (also see A7).	F2.1 See F1.1	Call a qualified refrigeration engineer to check for leaks and replenish refrigerant charge.
	F3 Problems to the refrigerant circuit (thermostatic valve).	F3.1 See F1.1	Call a qualified refrigeration engineer to check the thermostatic valve and to replace it, if necessary.
	F4 Problems to the power supply.	F4.1 See F1.1	Call an electrician to check the power supply of the unit. Find out and eliminate the causes of anomalies to the power supply line.
	F5 Compressor blocked.	F5.1 See F1.1	Call a qualified refrigeration engineer to check the compressor and to replace it, if necessary.
G Digital display and all LEDs off although main switch On ("I").	G1 Control board fuse blown. Power supply fluctuations or 'spikes'.	G1.1 Despite presence of power at the input terminals, the digital display and all LEDs remain unlit.	Replace the fuse. Provide cleaner power supply to the unit.
	G2 Abnormal power consumption by one or more of the control board components.	G2.1 See G1.1 .	Replace the fuse and, if necessary, replace the control board.

PROBLEM	CAUSE	SYMPTOM	REMEDY
H Alarm "Water inlet or outlet probe damaged/unconnected" trips.	H1 BEWIT, BEWOT sensor in open or in short circuit.	H1.1 • See problem; • main alarm relay tripped.	Check that the temperature sensors are correctly connected to the control board terminals and that the cable is undamaged. If necessary replace the temperature sensors.
I Low water inlet temperature alarm trips.	I1 The value set in the parameter of the appropriate alarm threshold is higher than value measured by BEWIT probe.	I1.1 • See problem; • main alarm relay tripped.	Identify and remove the cause which provoked BEWIT temperature decreasing to a value lower than the preset one.
J High water inlet temperature alarm trips.	J1 See points A1 and A7 . The value set in the appropriate parameter is lower than value measured by BEWIT probe.	J1.1 • See problem; • main alarm relay tripped.	Identify and remove the cause which provoked BEWIT temperature increasing to a value higher than the preset one.
K Low water outlet temperature alarm trips.	K1 The value set as LOW WATER OUTLET TEMPERATURE alarm threshold is higher than value measured by BEWOT probe.	K1.1 • See problem; • the compressor stops and restarts when the alarm threshold is exceed; • main alarm relay tripped.	Identify and remove the cause which provoked BEWOT temperature decreasing to a value lower than the preset one.
	K2 Water flow too low.	K2.1 See K1.1 .	Increase the water flow.
	K3 Temperature SET POINT value is too low.	K3.1 See K1.1 .	Increase the SET POINT value.
L High water outlet temperature alarm trips.	L1 See points A1 and A7 . The value set as HIGH WATER OUTLET TEMPERATURE alarm threshold is lower than value measured by BEWOT probe.	L1.1 • See problem; • main alarm relay tripped.	Identify and remove the cause which provoked BEWOT temperature increasing to a value higher than the preset one.
M Fan(s) overload alarm trips (thermal protection of fans).	M1 The thermal protection of one of the fans has tripped because the temperature of the air expelled is very high.	M1.1 • See problem; • main alarm relay tripped; • refrigerant compressor stops; • ALARM led lights up.	Check that the ambient air temperature is within the preset limits.
	M2 See point F4 . The motor of one of the fans is blocked or risks seizing.	M2.1 • See problem; • main alarm relay tripped; • refrigerant compressor stops; • ALARM led lights up; • operation in one of the fans is noisy.	Identify and check the damaged fan and replace it if necessary.
N Oil pressure switch alarm trips.	N1 Lack of oil in the compressor casing.	N1.1 • See problem; • main alarm relay tripped; • refrigerant compressor stops; • ALARM led lights up.	Check that no improper operation has been carried out; e.g., starting the compressor without a flow of cooled water. Have the plant checked by a refrigeration engineer and add oil in the compressor until it is seen in the oil indicator. ATTENTION: The oil must be the same as the one already present.
	N2 Various startings-up without oil pre-heating resistance.	N2.1 See N1.1 .	To pre-heat the oil, at the first starting-up after various days of stopping, after putting the main switch in the close position ("I"), wait 4 hours at least before starting-up the unit with ON/OFF button of the board. (see chap. "8.2 Start up").
O Alarm "Eprom damaged" trips.	O1 Board microprocessor initialising error.	O1.1 Alarm signal and unit blocked.	Turn off and turn on the unit. If this doesn't solve the problem, contact the nearest service centre.

PROBLEM	CAUSE	SYMPTOM	REMEDY
P Pump overload alarm trips.	P1 The pump's thermal protection device has tripped because the water flow is too high.	P1.1 <ul style="list-style-type: none"> • See problem; • main alarm relay tripped; • the refrigerant compressor and pump stop; • ALARM led lights up; • the pressure difference read on the machine gauge with the pump stopped and pump running is lower than the available head with maximum pump flow (see chap. "Plumbing connections"). 	Reset the thermal protection device. Increase the pressure drop in the hydraulic circuit, for example by partially closing the pump output valve.
	P2 The grille through which the pump cooling air passes is obstructed.	P2.1 <ul style="list-style-type: none"> • See problem; • main alarm relay tripped; • the refrigerant compressor and pump stop; • ALARM led lights up. 	Reset the thermal protection device. Free the grille.
	P3 The pump is defective.	P3.1 <ul style="list-style-type: none"> • See problem; • main alarm relay tripped; • the refrigerant compressor and pump stop; • ALARM led lights up; • the current absorbed by the pump is higher than the nominal rating; • the pump may be noisy. 	Reset the thermal protection device. Replace the pump.
	P4 Incorrect pump rotation direction.	P4.1 See P3.1 .	Invert the position of two phases of the pump power supply (see chap. " 8.2 Start up ").
Q Water differential pressure switch alarm trips.	Q1 See point F4 . The pump doesn't work.	Q1.1 <ul style="list-style-type: none"> • See problem; • main alarm relay tripped; • the refrigerant compressor and pump stop; • ALARM led lights up. 	Check the state of the pump.
	Q2 The water circuit is obstructed outside the machine.	Q2.1 <ul style="list-style-type: none"> • See problem; • main alarm relay tripped; • the refrigerant compressor and pump stop; • ALARM led lights up. 	Check the external water circuit.
	Q3 Water inlet and outlet connections inverted.	Q3.1 <ul style="list-style-type: none"> • See problem; • main alarm relay tripped; • the refrigerant compressor and pump stop; • ALARM led lights up. 	Provide to connect correctly the water inlet and outlet connections (see annexed overall dimension drawings).


ALARMS MANAGEMENT

13.1 Alarms signals



13.1.1 Alarms displaying

During unit operation, some alarm conditions could happen. Depending on their danger they could be controlled by pCO by means of a simple signal or by means of the partial / complete block of the unit.

When an alarm occurs, on the pCO display appears “ENABLED ALARM” and the red led of the button  lights up.

Press the button  on the terminal to visualize the first alarm mask.

On the right corner it will be visualized the number of active alarm.

Use the button  or  on the terminal to run the other alarm messages.





Use the alarm list to identify the alarm displayed and to have more information (see paragraph "13.3 Alarms masks").

13.2 Alarms reset


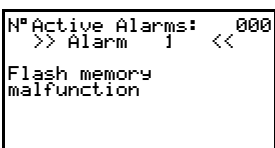
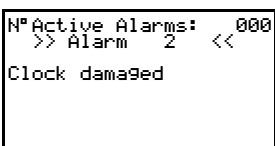
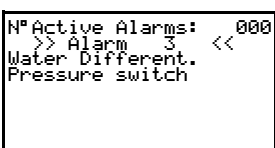
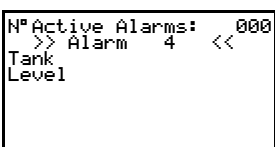
When the alarm cause has been resolved, if it was of automatic reset type the unit will automatically return to normal operation.

If the alarm was of manual reset type, press  button for more times until reaching the reset.

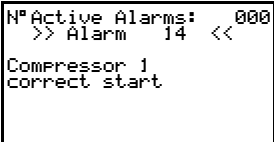
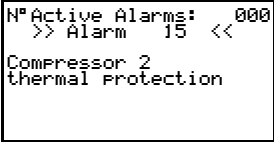
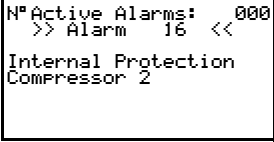
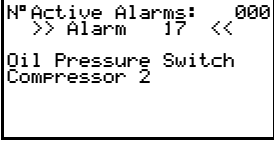
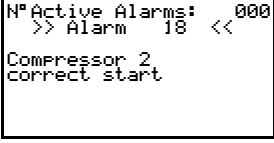
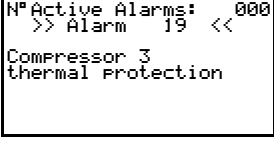
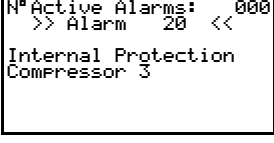
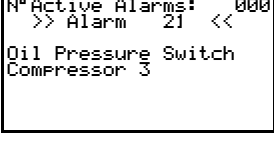
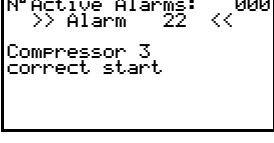
The message “No Alarm Active” will appear on the display if the button  is pressed without any alarm on.

To return to the main mask press  button.

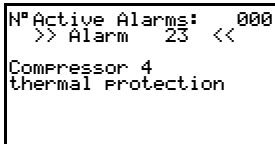
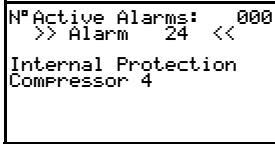
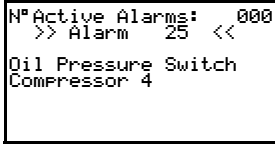
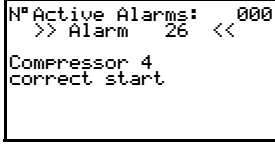
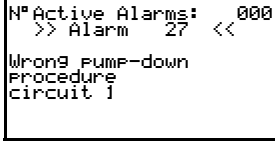
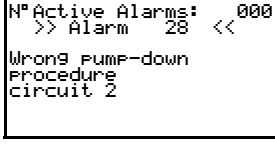
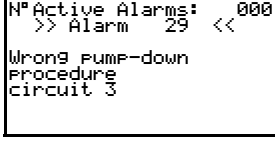
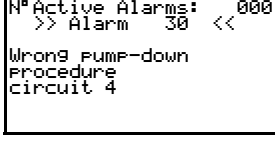
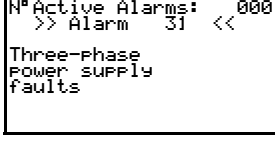
13.3 Alarms masks

Ref.	Masks	Reset	Controller action	Input	Notes
ALARM000					No active alarm mask.
ALARM001		aut.	Complete stop of the unit and of the pump	---	The pCO memory is irreparably damaged. Try to restart the unit. If the alarm repeats, call an authorised service centre.
ALARM002		aut.	Complete stop of the unit and of the pump	---	The Clock board of pCO is irreparably damaged. Try to restart the unit. If the alarm repeats, call an authorised service centre.
ALARM003		manual	Complete stop of the unit and of the pump.	ID3 Master Board	Insufficient water flow throughout the evaporator (differential pressure switch).
ALARM004		manual	Complete stop of the unit and of the pump.	ID3 Master Board	Insufficient water level in the tank. When the water level in the tank is restored, the alarm is automatically reset.

Ref.	Masks	Reset	Controller action	Input	Notes
ALARM005	<div> N° Active Alarms: 000 >> Alarm 5 << Evaporator PUMP 1 overload </div>	manual	Complete stop of the unit and of the pump.	ID2 Slave Board	Pump 1 overload
ALARM006	<div> N° Active Alarms: 000 >> Alarm 6 << Evaporator PUMP 2 overload </div>	manual	Complete stop of the unit and of the pump.	ID3 Slave Board	Pump 2 overload
ALARM007	<div> N° Active Alarms: 000 >> Alarm 7 << Fan overload/ regulator fault unit 1 </div>	manual	Circuit 1 fans and compressors stop.	ID12 Master Board	This alarm occurs only in the event of fans variable speed regulation, when the regulator has anomalies during its operation or in the event of circuit 1 fans overload.
ALARM008	<div> N° Active Alarms: 000 >> Alarm 8 << Fan overload/ regulator fault unit 2 </div>	manual	Circuit 2 fans and compressors stop.	ID12 Slave Board	This alarm occurs only in the event of fans variable speed regulation, when the regulator has anomalies during its operation or in the event of circuit 2 fans overload.
ALARM009	<div> N° Active Alarms: 000 >> Alarm 9 << Fan overload/ regulator fault unit 3 </div>	manual	Circuit 3 fans and compressors stop.	ID13 Master Board	This alarm occurs only in the event of fans variable speed regulation, when the regulator has anomalies during its operation or in the event of circuit 3 fans overload.
ALARM010	<div> N° Active Alarms: 000 >> Alarm 10 << Fan overload/ regulator fault unit 4 </div>	manual	Circuit 4 fans and compressors stop.	ID13 Slave Board	This alarm occurs only in the event of fans variable speed regulation, when the regulator has anomalies during its operation or in the event of circuit 4 fans overload.
ALARM011	<div> N° Active Alarms: 000 >> Alarm 11 << Compressor 1 thermal protection </div>	manual	The compressor 1 stops	ID6 Master Board	Compressor 1 overload
ALARM012	<div> N° Active Alarms: 000 >> Alarm 12 << Internal Protection Compressor 1 </div>	manual	The compressor 1 stops	ID7 Master Board	Internal protection of compressor 1 tripping
ALARM013	<div> N° Active Alarms: 000 >> Alarm 13 << Oil Pressure Switch Compressor 1 </div>	manual	The compressor 1 stops	ID5 Master Board	The oil level sensor of compressor 1 measures an insufficient oil level

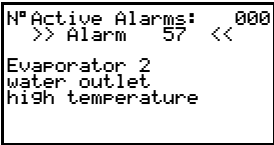
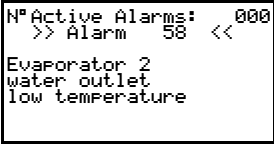
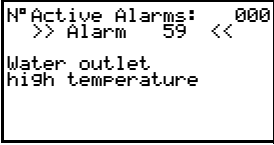
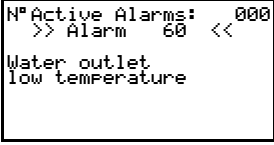
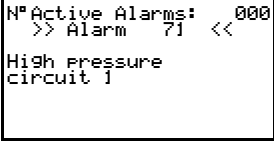
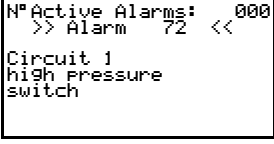
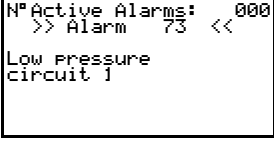
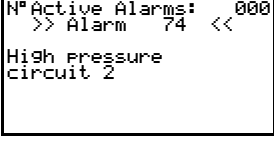
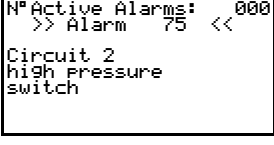
Ref.	Masks	Reset	Controller action	Input	Notes
ALARM014		manual	The compressor 1 stops	ID8 Master Board	Anomaly during part-winding procedure at compressor 1 starting-up
ALARM015		manual	The compressor 2 stops	ID6 Slave Board	Compressor 2 overload
ALARM016		manual	The compressor 2 stops	ID7 Slave Board	Internal protection of compressor 2 tripping
ALARM017		manual	The compressor 2 stops	ID5 Master Board	The oil level sensor of compressor 2 measures an insufficient oil level
ALARM018		manual	The compressor 2 stops	ID8 Slave Board	Anomaly during part-winding procedure at compressor 2 starting-up
ALARM019		manual	The compressor 3 stops	ID10 Master Board	Compressor 3 overload
ALARM020		manual	The compressor 3 stops	ID11 Master Board	Internal protection of compressor 3 tripping
ALARM021		manual	The compressor 3 stops	ID9 Master Board	The oil level sensor of compressor 3 measures an insufficient oil level
ALARM022		manual	The compressor 3 stops	ID8 Master Board	Anomaly during part-winding procedure at compressor 3 starting-up

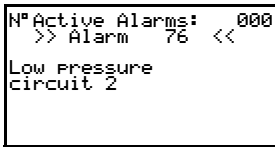
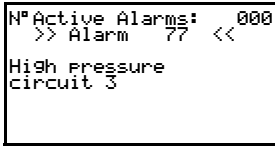
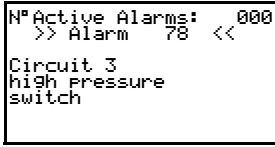
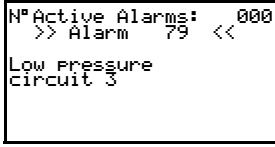
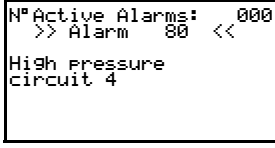
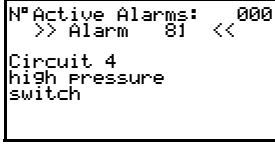
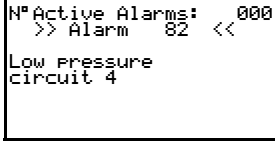
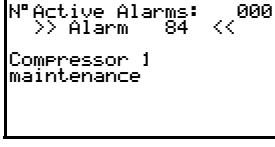
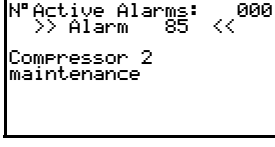
Alarms management

Ref.	Masks	Reset	Controller action	Input	Notes
ALARM023		manual	The compressor 4 stops	ID10 Slave Board	Compressor 4 overload
ALARM024		manual	The compressor 4 stops	ID11 Slave Board	Internal protection of compressor 4 tripping
ALARM025		manual	The compressor 4 stops	ID9 Slave Board	The oil level sensor of compressor 4 measures an insufficient oil level
ALARM026		manual	The compressor 4 stops	ID8 Slave Board	Anomaly during part-winding procedure at compressor 4 starting-up
ALARM027		manual	Circuit 1 stops	---	Error in the pump-down procedure in circuit 1: min. pressure level not reached during the pump-down delay time
ALARM028		manual	Circuit 2 stops	---	Error in the pump-down procedure in circuit 2: min. pressure level not reached during the pump-down delay time
ALARM029		manual	Circuit 3 stops	---	Error in the pump-down procedure in circuit 3: min. pressure level not reached during the pump-down delay time
ALARM030		manual	Circuit 4 stops	---	Error in the pump-down procedure in circuit 4: min. pressure level not reached during the pump-down delay time
ALARM031		aut.	Complete stop of the unit and of the pump	ID1 Slave Board	Anomalies due to the not correct phase sequence of the electrical supply. When the electrical supply is restored the alarm must be manually reset.

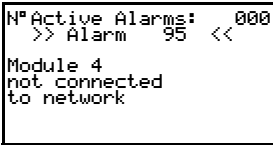
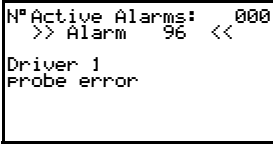
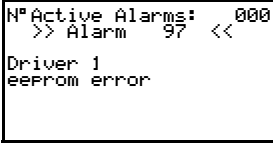
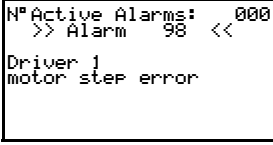
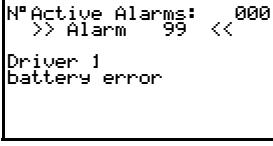
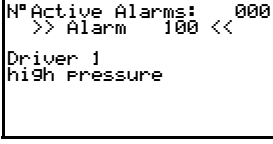
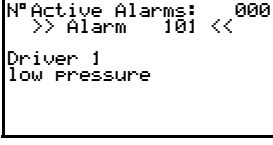

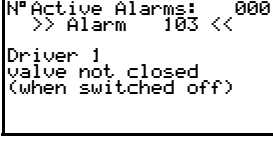
Ref.	Masks	Reset	Controller action	Input	Notes
ALARM032	<pre> N°Active Alarms: 000 >> Alarm 32 << -BHP1 pressure transducer dama9ed or disconn. </pre>	manual	Circuit 1 stops	B1 Master Board	The probe measures an out-of-range value: it may be damaged, not connected or short-circuited. See Chapter 10 "Pressure transducers".
ALARM033	<pre> N°Active Alarms: 000 >> Alarm 33 << -BLP1 pressure transducer dama9ed or disconn. </pre>	manual	Circuit 1 stops	B6 Master Board	The probe measures an out-of-range value: it may be damaged, not connected or short-circuited. See Chapter 10 "Pressure and temperature transducers".
ALARM034	<pre> N°Active Alarms: 000 >> Alarm 34 << -BHP2 pressure transducer dama9ed or disconn. </pre>	manual	Circuit 2 stops	B1 Slave Board	The probe measures an out-of-range value: it may be damaged, not connected or short-circuited. See Chapter 10 "Pressure and temperature transducers".
ALARM035	<pre> N°Active Alarms: 000 >> Alarm 35 << -BLP2 pressure transducer dama9ed or disconn. </pre>	manual	Circuit 2 stops	B6 Slave Board	The probe measures an out-of-range value: it may be damaged, not connected or short-circuited. See Chapter 10 "Pressure and temperature transducers".
ALARM036	<pre> N°Active Alarms: 000 >> Alarm 36 << -BHP3 pressure transducer dama9ed or disconn. </pre>	manual	Circuit 3 stops	B2 Master Board	The probe measures an out-of-range value: it may be damaged, not connected or short-circuited. See Chapter 10 "Pressure and temperature transducers".
ALARM037	<pre> N°Active Alarms: 000 >> Alarm 37 << -BLP3 pressure transducer dama9ed or disconn. </pre>	manual	Circuit 3 stops	B7 Master Board	The probe measures an out-of-range value: it may be damaged, not connected or short-circuited. See Chapter 10 "Pressure and temperature transducers".
ALARM038	<pre> N°Active Alarms: 000 >> Alarm 38 << -BHP4 pressure transducer dama9ed or disconn. </pre>	manual	Circuit 4 stops	B2 Slave Board	The probe measures an out-of-range value: it may be damaged, not connected or short-circuited. See Chapter 10 "Pressure and temperature transducers".
ALARM039	<pre> N°Active Alarms: 000 >> Alarm 39 << -BLP4 pressure transducer dama9ed or disconn. </pre>	manual	Circuit 4 stops	B7 Slave Board	The probe measures an out-of-range value: it may be damaged, not connected or short-circuited. See Chapter 10 "Pressure and temperature transducers".
ALARM040	<pre> N°Active Alarms: 000 >> Alarm 40 << -BEWIT temperature probe dama9ed or disconn. </pre>	Aut.	Stop of the unit, the pump remains on.	B3 Master Board	The probe measures an out-of-range value: it may be damaged, not connected or short-circuited. See Chapter 10 "Pressure and temperature transducers".

Ref.	Masks	Reset	Controller action	Input	Notes
ALARM041	<div>N° Active Alarms: 000 >> Alarm 41 << -BEWOT1 temperature Probe damaged or disconn.</div>	Aut.	Stop of the unit, the pump remains on.	B4 Master Board	The probe measures an out-of-range value: it may be damaged, not connected or short-circuited. See Chapter 10 "Pressure and temperature transducers".
ALARM042	<div>N° Active Alarms: 000 >> Alarm 42 << -BEWOT2 temperature Probe damaged or disconn.</div>	Aut.	Stop of the unit, the pump remains on.	B5 Master Board	The probe measures an out-of-range value: it may be damaged, not connected or short-circuited. See Chapter 10 "Pressure and temperature transducers".
ALARM043	<div>N° Active Alarms: 000 >> Alarm 43 << -BTWOT temperature Probe damaged or disconn.</div>	Aut.	Stop of the unit, the pump remains on and the antifreeze resistance switch on	B5 Slave Board	The probe measures an out-of-range value: it may be damaged, not connected or short-circuited. See Chapter 10 "Pressure and temperature transducers".
ALARM044	<div>N° Active Alarms: 000 >> Alarm 44 << -BAT1 temperature Probe damaged or disconn.</div>	Aut.	Stop of the unit, the pump remains on.	B8 Master Board	The probe measures an out-of-range value: it may be damaged, not connected or short-circuited. See Chapter 10 "Pressure and temperature transducers".
ALARM045	<div>N° Active Alarms: 000 >> Alarm 45 << -BAT2 temperature Probe damaged or disconn.</div>	Aut.	Stop of the unit, the pump remains on.	B3 Slave Board	The probe measures an out-of-range value: it may be damaged, not connected or short-circuited. See Chapter 10 "Pressure and temperature transducers".
ALARM053	<div>N° Active Alarms: 000 >> Alarm 53 << Evaporator water inlet high temperature</div>	manual	Stop of the unit, the pump remains on.	B3 Master Board	The temperature value measured by the probe is equal to or higher than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL001 .
ALARM054	<div>N° Active Alarms: 000 >> Alarm 54 << Evaporator water inlet low temperature</div>	Aut.	Stop of the unit, the pump remains on.	B3 Master Board	The temperature value measured by the probe is equal to or lower than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL001 .
ALARM055	<div>N° Active Alarms: 000 >> Alarm 55 << Evaporator 1 water outlet high temperature</div>	Aut.	Stop of the unit, the pump remains on.	B4 Master Board	The temperature value measured by the probe is equal to or higher than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL002 .
ALARM056	<div>N° Active Alarms: 000 >> Alarm 56 << Evaporator 1 water outlet low temperature</div>	Aut.	Stop of the unit, the pump remains on.	B4 Master Board	The temperature value measured by the probe is equal to or lower than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL002 .

Ref.	Masks	Reset	Controller action	Input	Notes
ALARM057		Aut.	Stop of the unit, the pump remains on.	B5 Master Board	The temperature value measured by the probe is equal to or higher than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL002.
ALARM058		Aut.	Stop of the unit, the pump remains on.	B5 Master Board	The temperature value measured by the probe is equal to or lower than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL002.
ALARM059		Aut.	Stop of the unit, the pump remains on.	B5 Slave Board	The temperature value measured by the probe is equal to or higher than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL002.
ALARM060		Aut.	Stop of the unit, the pump remains on.	B5 Slave Board	The temperature value measured by the probe is equal to or lower than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL003.
ALARM071		manual	Circuit 1 stop	B1 Master Board	The pressure value measured by the high pressure transducer of circuit 1 is equal or higher than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL005.
ALARM072		manual	Circuit 1 stop	Id14 Master Board	The pressure value in circuit 1 is equal or higher than the set-point of the pressure switch.
ALARM073		manual	Circuit 1 stop	B6 Master Board	The pressure value measured by the low pressure transducer of circuit 1 is equal or higher than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL004.
ALARM074		manual	Circuit 2 stop	B2 Slave Board	The pressure value measured by the high pressure transducer of circuit 2 is equal or higher than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL005.
ALARM075		manual	Circuit 2 stop	ID14 Slave Board	The pressure value in circuit 2 is equal or higher than the set-point of the pressure switch.

Ref.	Masks	Reset	Controller action	Input	Notes
ALARM076		manual	Circuit 2 stop	B6 Slave Board	The pressure value measured by the low pressure transducer of circuit 2 is equal or higher than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL004 .
ALARM077		manual	Circuit 3 stop	B2 Master Board	The pressure value measured by the high pressure transducer of circuit 3 is equal or higher than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL005 .
ALARM078		manual	Circuit 3 stop	ID15 Master Board	The pressure value in circuit 3 is equal or higher than the set-point of the pressure switch.
ALARM079		manual	Circuit 3 stop	B7 Master Board	The pressure value measured by the low pressure transducer of circuit 3 is equal or higher than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL004 .
ALARM080		manual	Circuit 4 stop	B2 Slave Board	The pressure value measured by the high pressure transducer of circuit 4 is equal or higher than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL005 .
ALARM081		manual	Circuit 4 stop	ID15 Slave Board	The pressure value in circuit 4 is equal or higher than the set-point of the pressure switch.
ALARM082		manual	Circuit 4 stop	B7 Slave Board	The pressure value measured by the low pressure transducer of circuit 4 is equal or higher than the alarm threshold. See Chapter 10 "Pressure and temperature transducers" and Ref. AL004 .
ALARM084		aut.	Warning	---	Compressor 1 maintenance is required. For further information see paragraph "9.19 Compressors management" .
ALARM085		aut.	Warning	---	Compressor 2 maintenance is required. For further information see paragraph "9.19 Compressors management" .

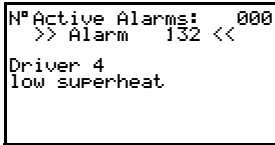
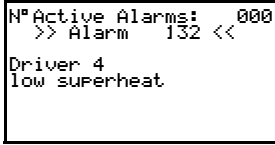
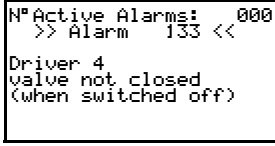
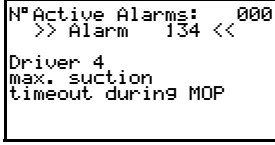
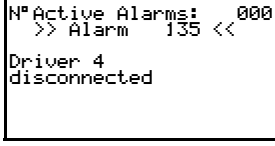
Ref.	Masks	Reset	Controller action	Input	Notes
ALARM086	<div> N° Active Alarms: 000 >> Alarm 86 << Compressor 3 maintenance </div>	aut.	Warning	---	Compressor 3 maintenance is required. For further information see paragraph "9.19 Compressors management" .
ALARM087	<div> N° Active Alarms: 000 >> Alarm 87 << Compressor 4 maintenance </div>	aut.	Warning	---	Compressor 4 maintenance is required. For further information see paragraph "9.19 Compressors management" .
ALARM088	<div> N° Active Alarms: 000 >> Alarm 88 << Evaporator PUMP 1 maintenance </div>	aut.	Warning	---	Pump 1 maintenance is required. For further information see paragraph "9.22 Circulation pump" .
ALARM089	<div> N° Active Alarms: 000 >> Alarm 89 << Evaporator PUMP 2 maintenance </div>	aut.	Warning	---	Pump 2 maintenance is required. For further information see paragraph "9.22 Circulation pump" .
ALARM090	<div> N° Active Alarms: 000 >> Alarm 90 << Unit maintenance </div>	aut.	Warning	---	Complete unit maintenance is required. For further information see paragraph "9.19 Compressors management" .
ALARM091	<div> N° Active Alarms: 000 >> Alarm 91 << Slave board disconnected </div>	aut.	Complete stop of the unit	---	The slave board is disconnected from the net.
ALARM092	<div> N° Active Alarms: 000 >> Alarm 92 << Module 1 not connected to network </div>	aut.	Warning	---	Module not connected to the net.
ALARM093	<div> N° Active Alarms: 000 >> Alarm 93 << Module 2 not connected to network </div>	aut.	Warning	---	Module not connected to the net.
ALARM094	<div> N° Active Alarms: 000 >> Alarm 94 << Module 3 not connected to network </div>	aut.	Warning	---	Module not connected to the net.

Ref.	Masks	Reset	Controller action	Input	Notes
ALARM095	 <pre> N° Active Alarms: 000 >> Alarm 95 << Module 4 not connected to network </pre>	aut.	Warning	---	Module not connected to the net.
ALARM096	 <pre> N° Active Alarms: 000 >> Alarm 96 << Driver 1 Probe error </pre>	aut.	Warning	---	One of the two probes connected to the Driver of the electronic thermostatic valve of circuit 1 is damaged or disconnected.
ALARM097	 <pre> N° Active Alarms: 000 >> Alarm 97 << Driver 1 EEPROM error </pre>	aut.	Warning	---	The Eeprom of the Driver of the electronic thermostatic valve of circuit 1 is damaged or has any anomaly.
ALARM098	 <pre> N° Active Alarms: 000 >> Alarm 98 << Driver 1 motor step error </pre>	aut.	Warning	---	The step-step motor which manages the electronic thermostatic valve of circuit 1 is damaged or has any anomaly.
ALARM099	 <pre> N° Active Alarms: 000 >> Alarm 99 << Driver 1 battery error </pre>	aut.	Warning	---	The battery which powers the Driver of circuit 1 is down or disconnected. This alarm appears only if the battery has been enabled (see Ref. DR001).
ALARM100	 <pre> N° Active Alarms: 000 >> Alarm 100 << Driver 1 high Pressure </pre>	aut.	Warning	---	The pressure probe connected to the Driver of the electronic thermostatic valve of circuit 1 measures a too high value.
ALARM101	 <pre> N° Active Alarms: 000 >> Alarm 101 << Driver 1 low Pressure </pre>	aut.	Warning	---	The pressure probe connected to the Driver of the electronic thermostatic valve of circuit 1 measures a too low value.
ALARM102	 <pre> N° Active Alarms: 000 >> Alarm 102 << Driver 1 low superheat </pre>	aut.	Warning	---	The superheating value elaborated by the Driver of the electronic thermostatic valve of circuit 1 is too low.
ALARM103	 <pre> N° Active Alarms: 000 >> Alarm 103 << Driver 1 valve not closed (when switched off) </pre>	aut.	Warning	---	At unit stopping, the Driver which elaborates the data of the electronic thermostatic valve of circuit 1 detects that the valve is not completely closed.

Ref.	Masks	Reset	Controller action	Input	Notes
ALARM104	<pre> N°Active Alarms: 000 >> Alarm 104 << Driver 1 max. suction timeout during MOP </pre>	aut.	Warning	---	The probe connected to the Driver of the electronic thermostatic valve of circuit 1 measures a too high temperature of the refrigerant fluid suction during MOP operation.
ALARM105	<pre> N°Active Alarms: 000 >> Alarm 105 << Driver 1 disconnected </pre>	aut.	Warning	---	The Driver of the electronic thermostatic valve of circuit 1 is disconnected or damaged.
ALARM106	<pre> N°Active Alarms: 000 >> Alarm 106 << Driver 2 Probe error </pre>	aut.	Warning	---	One of the two probes connected to the Driver of the electronic thermostatic valve of circuit 2 is damaged or disconnected.
ALARM107	<pre> N°Active Alarms: 000 >> Alarm 107 << Driver 2 eeprom error </pre>	aut.	Warning	---	The Eeprom of the Driver of the electronic thermostatic valve of circuit 2 is damaged or has any anomaly.
ALARM108	<pre> N°Active Alarms: 000 >> Alarm 108 << Driver 2 motor step error </pre>	aut.	Warning	---	The step-step motor which manages the electronic thermostatic valve of circuit 2 is damaged or has any anomaly.
ALARM109	<pre> N°Active Alarms: 000 >> Alarm 109 << Driver 2 battery error </pre>	aut.	Warning	---	The battery which powers the Driver of circuit 2 is down or disconnected. This alarm appears only if the battery has been enabled (see Ref. DR001).
ALARM110	<pre> N°Active Alarms: 000 >> Alarm 110 << Driver 2 high Pressure </pre>	aut.	Warning	---	The pressure probe connected to the Driver of the electronic thermostatic valve of circuit 2 measures a too high value.
ALARM111	<pre> N°Active Alarms: 000 >> Alarm 111 << Driver 2 low Pressure </pre>	aut.	Warning	---	The pressure probe connected to the Driver of the electronic thermostatic valve of circuit 2 measures a too low value.
ALARM112	<pre> N°Active Alarms: 000 >> Alarm 112 << Driver 2 low superheat </pre>	aut.	Warning	---	The superheating value elaborated by the Driver of the electronic thermostatic valve of circuit 2 is too low.

Ref.	Masks	Reset	Controller action	Input	Notes
ALARM113	<div> N° Active Alarms: 000 >> Alarm 113 << Driver 2 valve not closed (when switched off) </div>	aut.	Warning	---	At unit stopping, the Driver which elaborates the data of the electronic thermostatic valve of circuit 2 detects that the valve is not completely closed.
ALARM114	<div> N° Active Alarms: 000 >> Alarm 114 << Driver 2 max. suction timeout during MOP </div>	aut.	Warning	---	The probe connected to the Driver of the electronic thermostatic valve of circuit 2 measures a too high temperature of the refrigerant fluid suction during MOP operation.
ALARM115	<div> N° Active Alarms: 000 >> Alarm 115 << Driver 2 disconnected </div>	aut.	Warning	---	The Driver of the electronic thermostatic valve of circuit 2 is disconnected or damaged.
ALARM116	<div> N° Active Alarms: 000 >> Alarm 116 << Driver 3 Probe error </div>	aut.	Warning	---	One of the two probes connected to the Driver of the electronic thermostatic valve of circuit 3 is damaged or disconnected.
ALARM117	<div> N° Active Alarms: 000 >> Alarm 117 << Driver 3 eeprom error </div>	aut.	Warning	---	The Eeprom of the Driver of the electronic thermostatic valve of circuit 3 is damaged or has any anomaly.
ALARM118	<div> N° Active Alarms: 000 >> Alarm 118 << Driver 3 motor step error </div>	aut.	Warning	---	The step-step motor which manages the electronic thermostatic valve of circuit 3 is damaged or has any anomaly.
ALARM119	<div> N° Active Alarms: 000 >> Alarm 119 << Driver 3 battery error </div>	aut.	Warning	---	The battery which powers the Driver of circuit 3 is down or disconnected. This alarm appears only if the battery has been enabled (see Ref. DR001).
ALARM120	<div> N° Active Alarms: 000 >> Alarm 120 << Driver 3 high pressure </div>	aut.	Warning	---	The pressure probe connected to the Driver of the electronic thermostatic valve of circuit 3 measures a too high value.
ALARM121	<div> N° Active Alarms: 000 >> Alarm 121 << Driver 3 low pressure </div>	aut.	Warning	---	The pressure probe connected to the Driver of the electronic thermostatic valve of circuit 3 measures a too low value.

Ref.	Masks	Reset	Controller action	Input	Notes
ALARM122	<pre> N°Active Alarms: 000 >> Alarm 122 << Driver 3 low superheat </pre>	aut.	Warning	---	The superheating value elaborated by the Driver of the electronic thermostatic valve of circuit 3 is too low.
ALARM123	<pre> N°Active Alarms: 000 >> Alarm 123 << Driver 3 valve not closed (when switched off) </pre>	aut.	Warning	---	At unit stopping, the Driver which elaborates the data of the electronic thermostatic valve of circuit 3 detects that the valve is not completely closed.
ALARM124	<pre> N°Active Alarms: 000 >> Alarm 124 << Driver 3 max. suction timeout during MOP </pre>	aut.	Warning	---	The probe connected to the Driver of the electronic thermostatic valve of circuit 3 measures a too high temperature of the refrigerant fluid suction during MOP operation.
ALARM125	<pre> N°Active Alarms: 000 >> Alarm 125 << Driver 3 disconnected </pre>	aut.	Warning	---	The Driver of the electronic thermostatic valve of circuit 3 is disconnected or damaged.
ALARM126	<pre> N°Active Alarms: 000 >> Alarm 126 << Driver 4 Probe error </pre>	aut.	Warning	---	One of the two probes connected to the Driver of the electronic thermostatic valve of circuit 4 is damaged or disconnected.
ALARM127	<pre> N°Active Alarms: 000 >> Alarm 127 << Driver 4 eePROM error </pre>	aut.	Warning	---	The Eeprom of the Driver of the electronic thermostatic valve of circuit 4 is damaged or has any anomaly.
ALARM128	<pre> N°Active Alarms: 000 >> Alarm 128 << Driver 4 motor step error </pre>	aut.	Warning	---	The step-step motor which manages the electronic thermostatic valve of circuit 4 is damaged or has any anomaly.
ALARM129	<pre> N°Active Alarms: 000 >> Alarm 129 << Driver 4 battery error </pre>	aut.	Warning	---	The battery which powers the Driver of circuit 4 is down or disconnected. This alarm appears only if the battery has been enabled (see Ref. DR001).
ALARM130	<pre> N°Active Alarms: 000 >> Alarm 130 << Driver 4 high pressure </pre>	aut.	Warning	---	The pressure probe connected to the Driver of the electronic thermostatic valve of circuit 4 measures a too high value.

Ref.	Masks	Reset	Controller action	Input	Notes
ALARM131		aut.	Warning	---	The pressure probe connected to the Driver of the electronic thermostatic valve of circuit 4 measures a too low value.
ALARM132		aut.	Warning	---	The superheating value elaborated by the Driver of the electronic thermostatic valve of circuit 4 is too low.
ALARM133		aut.	Warning	---	At unit stopping, the Driver which elaborates the data of the electronic thermostatic valve of circuit 4 detects that the valve is not completely closed.
ALARM134		aut.	Warning	---	The probe connected to the Driver of the electronic thermostatic valve of circuit 4 measures a too high temperature of the refrigerant fluid suction during MOP operation.
ALARM135		aut.	Warning	---	The Driver of the electronic thermostatic valve of circuit 4 is disconnected or damaged.

CHAPTER 14



HISTORIAL

The electronic control has a loop named “historial” (masks **Ref.** HS000), see Chapter 15 “Settings password required”, in which are stored:

- the last 50 accesses to the User, Service and Manufacturer menu with date and time;
- the last 50 alarms and:
 - alarm code;
 - trip date and time;
 - BEWIT, -BEWOT1, -BEWOT2, -BAT1, -BAT2 and -BTWOT temperatures (if present **Ref.** CU004) at tripping;
 - low and high pressure at tripping;
 - output and input status of MASTER and SLAVE board at tripping;
 - fans analogue output status (only if the speed control operation has been enabled) at tripping;
- status of the electronic thermostatic valve Driver (only if enabled **Ref.** DR001) at tripping;
- the last 20 supply alarms (trips and resets).

NOTE

The historial can be resetted only with the password.

CHAPTER 15

SETTINGS TABLES

The following tables show the list of all masks which contain adjustable parameters, important for unit operation.

The absence of any mask on the display is not a malfunction.

ATTENTION

The displaying of some masks depends on the settings of other masks and also on the unit configuration, decided during design phase.

All masks are identified by means of a code indicated in **Ref.** column; this code will be used in the manual to identify easily any mask.

On **Factory setting** column are indicated the setting values set during the unit testing; they are referred only to the unit which has the same serial number you can find on the label of the first page of this manual.

DANGER

The modifying of the unit of measurement causes the resetting of all parameters, they returns to manufacturer values.

The electronic control automatically converts the parameters value from a unit of measurement to another one.

SETTINGS NO PASSWORD REQUIRED

ATTENTION

The modifying of the parameters must be carried out by specialized personnel only.

To modify the following parameters follow the procedure described in Chapter 9 “How to modify a parameter in “Free Menu”“

Ref.	Masks	Factory Setting
SET-POINT		
SP002	<div> Summer .SP002 setpoint 000.0° C Second Summer Setp. 000.0° C Winter Setpoint 000.0° C Second Setpoint 000.0° C </div>	007.0 010.0 / /
SP003	<div> Maximum .SP003 compensation setpoint 00.0° C Summer Compensation: Temperature Setpoint Ambient 00.0° C Different. 00.0° C </div>	03.0 30.0 06.0

Ref.	Masks	Factory Setting
SP005	<div>Adjustable Setpoint: Min. (4mA) 000.0°C Max. (20mA) 000.0°C</div> <div>• SP005</div>	
SP006	<div>Band 1 Setpoint Variation: Starting time 00:00</div> <div>• SP006</div> <div>Temperature Setpoint: summer 000.0°C Setpoint 000.0°C</div>	
SP007	<div>Band 2 Setpoint Variation: Starting time 00:00</div> <div>• SP007</div> <div>Temperature Setpoint: summer 000.0°C Setpoint 000.0°C</div>	
SP008	<div>Band 3 Setpoint Variation: Starting time 00:00</div> <div>• SP008</div> <div>Temperature Setpoint: summer 000.0°C Setpoint 000.0°C</div>	
SP009	<div>Band 4 Setpoint Variation: Starting time 00:00</div> <div>• SP009</div> <div>Temperature Setpoint: summer 000.0°C Setpoint 000.0°C</div>	
SP010	<div>PID Constant Reg.: Dead zone 00.0°C Proportional 00.0°C Integral 00000s Derivative 00000s Required update interval 00000ms</div> <div>• SP010</div>	00.0 02.0 00000 00000 01000
SP011	<div>Regulation band Summer 00.0°C Winter 00.0°C</div> <div>• SP011</div>	02.0 /
USER		

Ref.	Masks	Factory Setting
US00 1	<div> Language •US001 Used: German Unit working: Chiller </div>	English Chiller
US00 2	<div> Input enable: •US002 Remote On/Off No Summer/Winter No Automatic restart after blackout: No </div>	No No Yes
US00 3	<div> Module •US003 Override to Local Operation No </div>	No

SETTINGS PASSWORD REQUIRED

ATTENTION

The modifying of the parameters must be carried out by specialized personnel only, therefore it is necessary to call an authorized service centre.

To modify the following parameters follow the procedure described in Chapter 9 "How to modify a parameter of "Password Menu"

Rif	Masks	Factory Setting
UNIT CONFIGURATION		
CU00 2	<div> Adj. •CU002 Probe: Summer working -BEWIT </div>	BEW0T
CU00 3	<div> Unit of measurement: •CU003 Temperature °C Pressure bar Convers. gas: R22 </div>	°C bar R134a
MODULARITY		
DRIVER		
WORKED HOURS		

Rif	Masks	Factory Setting
OL00 2	<div> Unit Working hours counter: •OL002 Working hours 000000 Hours reset No </div>	No
OL00 3	<div> Compressor 1 counts: •OL003 Working hours 000000 N° of starts 000000 Hours reset No Starts reset No </div>	No No
OL00 4	<div> Compressor 2 counts: •OL004 Working hours 000000 N° of starts 000000 Hours reset No Starts reset No </div>	No No
OL00 5	<div> Compressor 3 counts: •OL005 Working hours 000000 N° of starts 000000 Hours reset No Starts reset No </div>	No No
OL00 6	<div> Compressor 4 counts: •OL006 Working hours 000000 N° of starts 000000 Hours reset No Starts reset No </div>	No No
OL00 7	<div> Pump 1 counts: •OL007 Working hours 000000 N° of starts 000000 Hours reset No Starts reset No </div>	No No
OL00 8	<div> Pump 2 counts: •OL008 Working hours 000000 N° of starts 000000 Hours reset No Starts reset No </div>	No No
MANUAL OPERATION		
COMPRESSORS		
PUMPS		

Rif	Masks	Factory Setting
FANS		
RECOVERY		
ANTIFREEZE		
AN002	<div> Evaporator •AN002 PUMPS operation with antifreeze function: No Setpoint 00.0°C Differential 00.0°C </div>	00.0 00.0
AN003	<div> Evaporator •AN003 antifreeze heater operation: No Setpoint 00.0°C Differential 00.0°C Activat. No </div>	-11 2 Stand-by
DEFROSTING		
ALARMS		
CLOCK		
WT00 1	<div> Clock •WT001 setting: Time 00:00 Date 00/00/00 </div>	
WT00 2	<div> Unit On/Off •WT002 weekly band: Enabling No Start day Stop day </div>	
WT00 3	<div> On/Off Daily •WT003 Unit band: Enabling No Starting 00:00 Stopping 00:00 </div>	
WT00 4	<div> Low noise •WT004 function: Enabling 00:00 Disabling 00:00 </div>	
HISTORIAL		

Rif	Masks	Factory Setting
HS00 0	<div> Historial: HS000 Alarms Supply </div>	
HS00 1	<div> 00/00/00 •HS001 00:00 </div>	
HS00 2	<div> Water •HS002 Temperature: Evap. IN 000.0°C Evap.1 OUT 000.0°C Evap.2 OUT 000.0°C Outlet 000.0°C </div>	
HS00 3	<div> Ambient •HS003 air: Ambient 1 000.0°C Ambient 2 000.0°C </div>	
HS00 4	<div> Water •HS004 Temperature: Condens. IN 000.0°C Condens. OUT 000.0°C </div>	
HS00 5	<div> Discharge •HS005 temperature: Circuit 1 000.0°C Circuit 2 000.0°C Circuit 3 000.0°C Circuit 4 000.0°C </div>	
HS00 6	<div> Freecooling •HS006 inlet water temperature 000.0°C </div>	

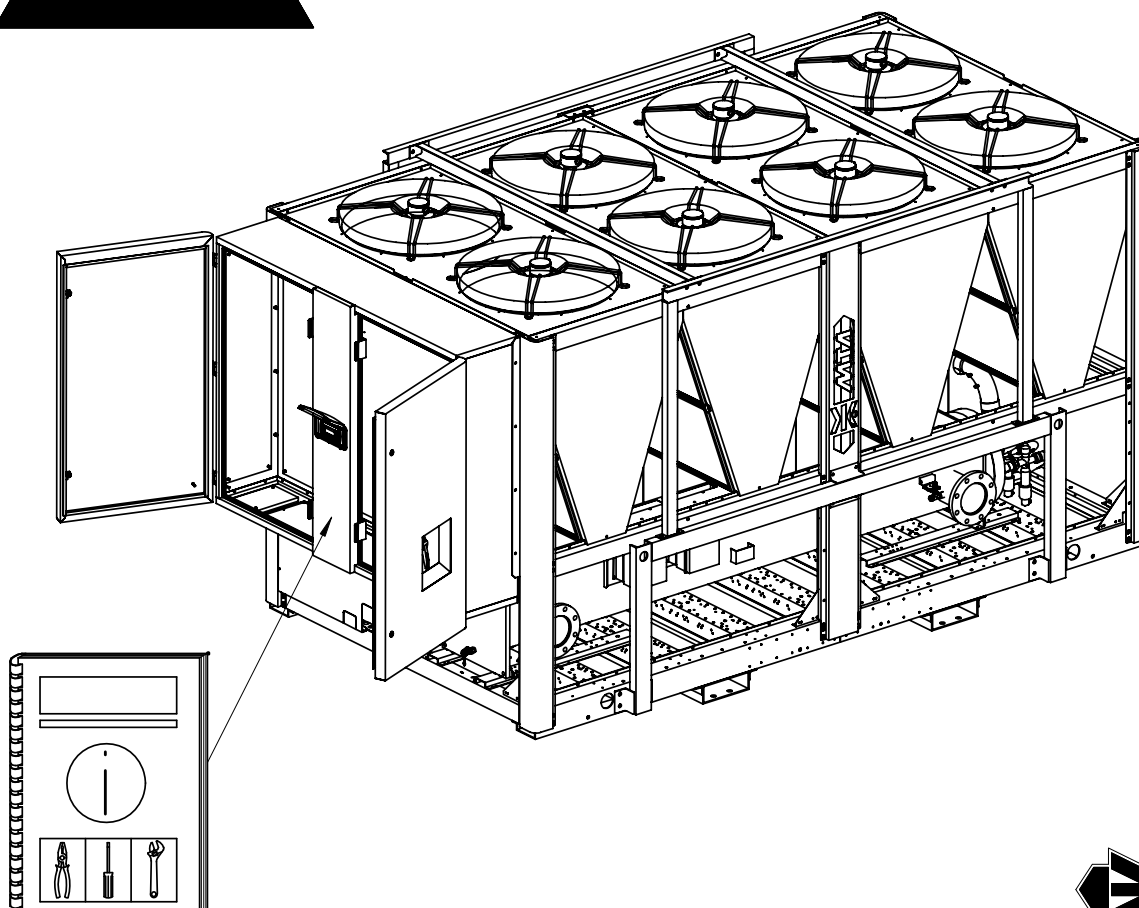
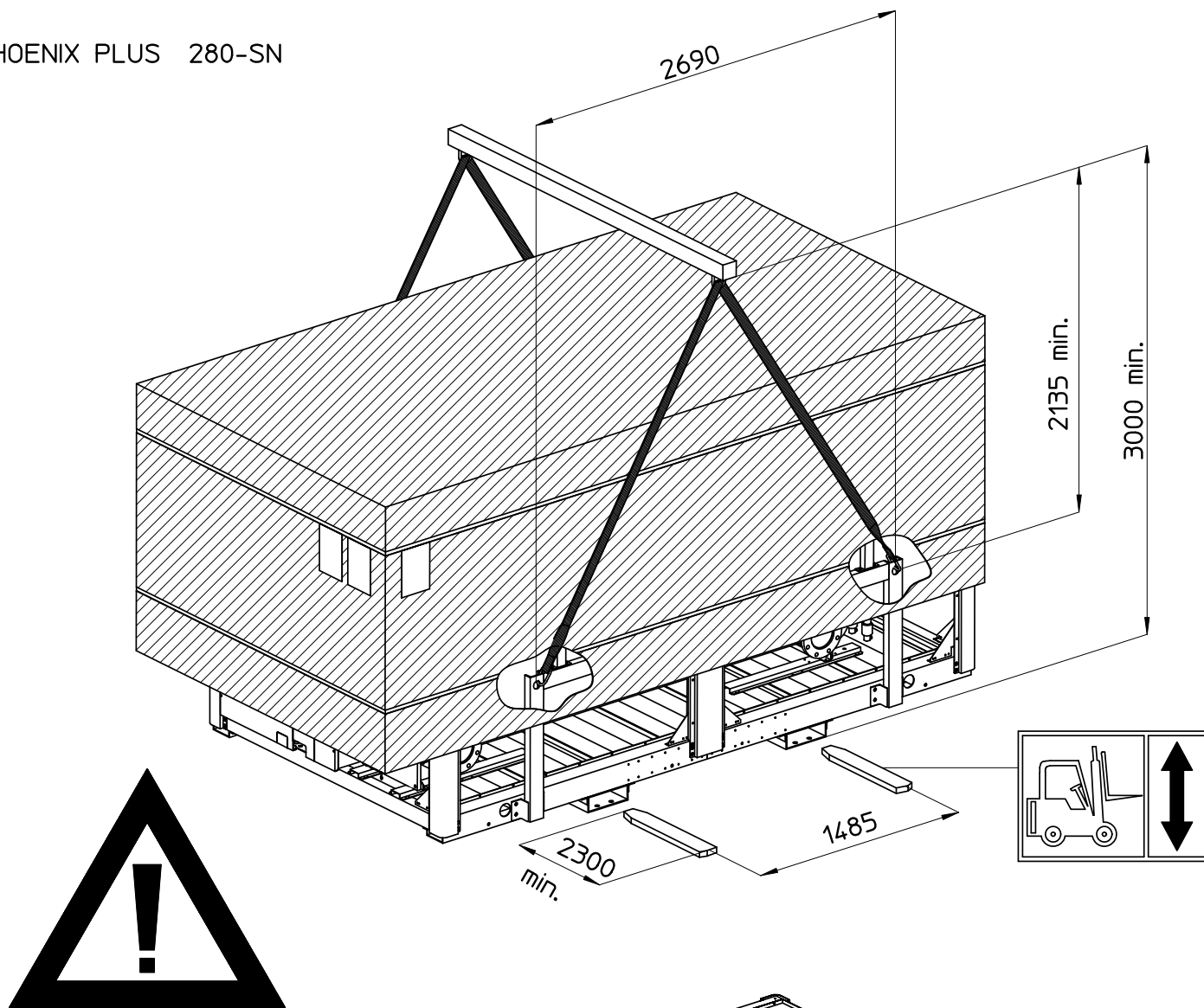
Rif	Masks	Factory Setting
HS00 7	<div> •HS007 Circuit 1: High Press. 000.0bar Low Press. 000.0bar Circuit 2: High Press. 000.0bar Low Press. 000.0bar </div>	
HS00 8	<div> •HS008 Circuit 3: High Press. 000.0bar Low Press. 000.0bar Circuit 4: High Press. 000.0bar Low Press. 000.0bar </div>	
HS00 9	<div> Master Board: •HS009 Digital Inputs(1..18) 00000000000000000000 Digital Outputs(1..18) 00000000000000000000 </div>	
HS01 0	<div> Slave Board: •HS010 Digital Inputs(1..18) 00000000000000000000 Digital Outputs(1..18) 00000000000000000000 </div>	
HS01 1	<div> Fan •HS011 Outputs: Step1 Step2 Circuit 1 OFF OFF Circuit 2 OFF OFF Circuit 3 OFF OFF Circuit 4 OFF OFF </div>	
HS01 2	<div> Analog •HS012 Outputs: Fan 1 Speed Reg. 000% Regol.Vel.Vent.2 000% Regol.Vel.Vent.3 000% Regol.Vel.Vent.4 000% </div>	
HS01 3	<div> Analog •HS013 Outputs: Condens.1 valve 000% Condens.2 valve 000% Condens.3 valve 000% Condens.4 valve 000% </div>	

Rif	Masks	Factory Setting
HS01 4	<div> Analog •HS014 Outputs: Freecooling valve.000% Vent.Freecooling 000% </div>	
HS01 5	<div> Driver •HS015 Valve 1: Valve Position 0000 SuperHeat 00.0°C Suct. Temp. 00.0°C </div>	
HS01 6	<div> Driver •HS016 Valve 2: Valve Position 0000 SuperHeat 00.0°C Suct. Temp. 00.0°C </div>	
HS01 7	<div> Driver •HS017 Valve 3: Valve Position 0000 SuperHeat 00.0°C Suct. Temp. 00.0°C </div>	
HS01 8	<div> Driver •HS018 Valve 4: Valve Position 0000 SuperHeat 00.0°C Suct. Temp. 00.0°C </div>	
HS02 2	<div> •HS022 00/00/00 00:00 </div>	
SUPERVISOR		
SU00 1	<div> •SU001 Supervision system enabling: No </div>	No

Rif	Masks	Factory Setting
SU00 2	<div> Number .SU002 identific. for BMS net: 000 Speed: 1200 bps Protocol: -- On/Off Enable by Supervisor: No </div>	
SU00 3	<div> Telephon book .SU003 maximum numbers : 0 Telephon book number - Modem Password: 0000 </div>	
SU00 4	<div> Externa: .SU004 No. of Ringtones 0 Modem Type Tones SMS Send: No </div>	
SPECIAL FUNCTIONS		
OTHER SETTINGS		
AI00 2	<div> Set-point .AI002 management mode: FIXED -BAT1 </div>	Fixed
AI00 4	<div> Sensors reading .AI004 calibration: <div> -BEWIT 00.0°C -BEWOT1 00.0°C -BEWOT2 00.0°C -BTWOT 00.0°C </div> </div>	00.0 00.0 00.0 00.0
AI011	<div> . AI011 New User Password 00000 </div>	805



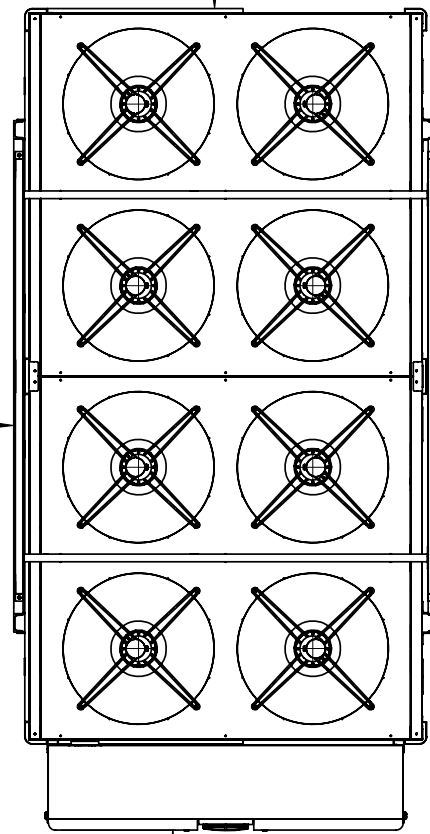
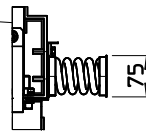
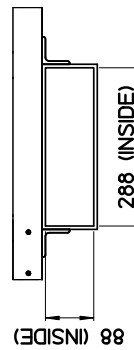
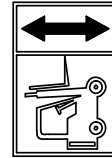
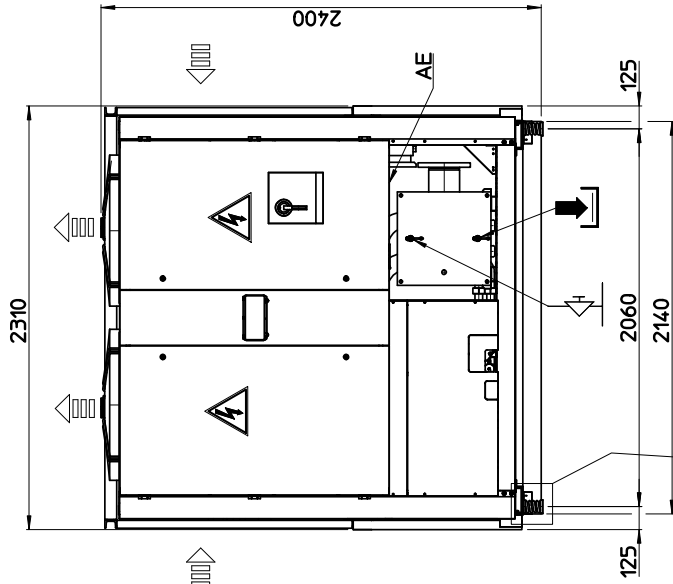
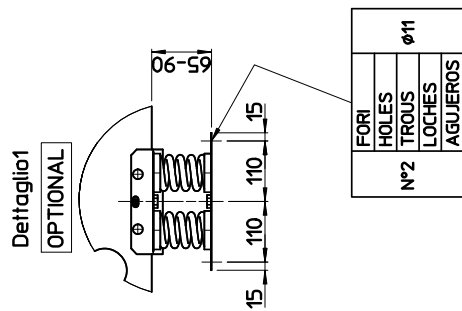
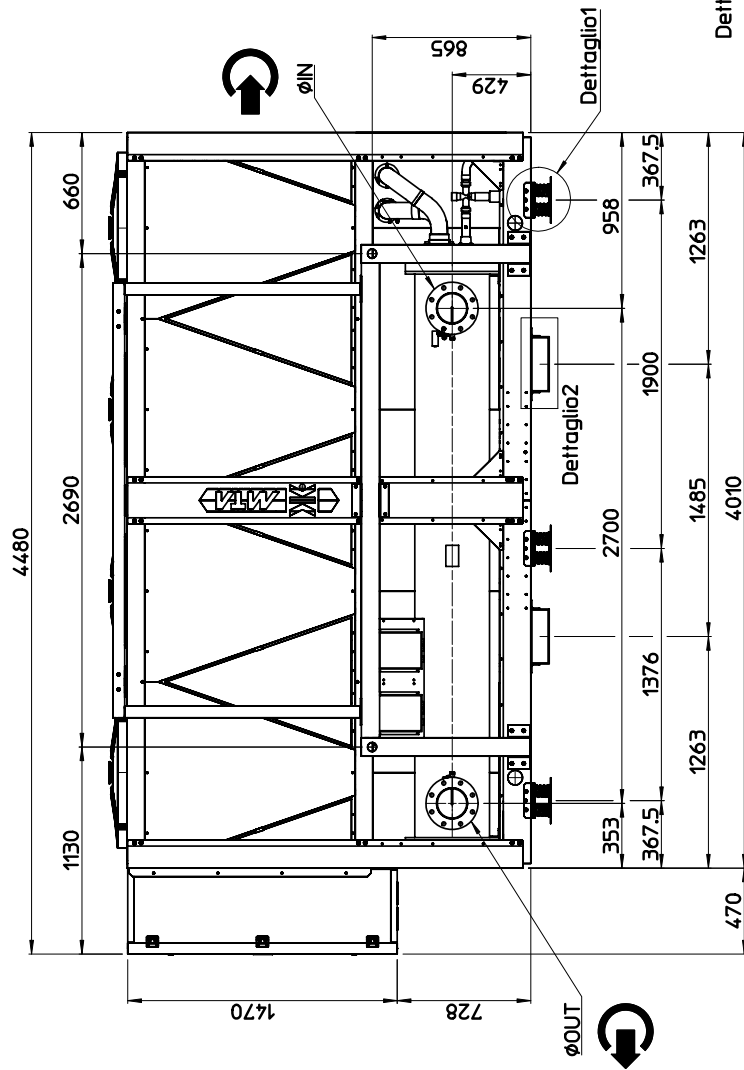
PHOENIX PLUS 280-SN





1050800006-010




MTA S.p.A.
PADOVA ITALY




 Ø19	INGRESSO ACQUA	DN 150 PN16 UNI 2278
	WATER INLET	
	ENTREE D'EAU	
	WASSEREINTRITT	
	ENTRADA DE AGUA	

	SCARICO ACQUA
	WATER DRAIN
	PURGE EAU
	WASSERBLASS
	DESCARGA

	SFIATO
	VENT
	EVENT
	ENTLUFTUNG
	VENTEO

 ØOUT	USCITA ACQUA	DN 150 PN16 UNI 2278
	WATER OUTLET	
	SORTIE D'EAU	
	WASSERAUSSTRIIT	
	SAIDA DEI AGUA	

	ALIMENTAZIONE ELETTRICA POWER SUPPLY ALIMENTATION ELECTRIQUE ELEKTROANSCHLUB ALIMENTACION ELECTRICA
AE	

1	1
REVISIONE INDEX	

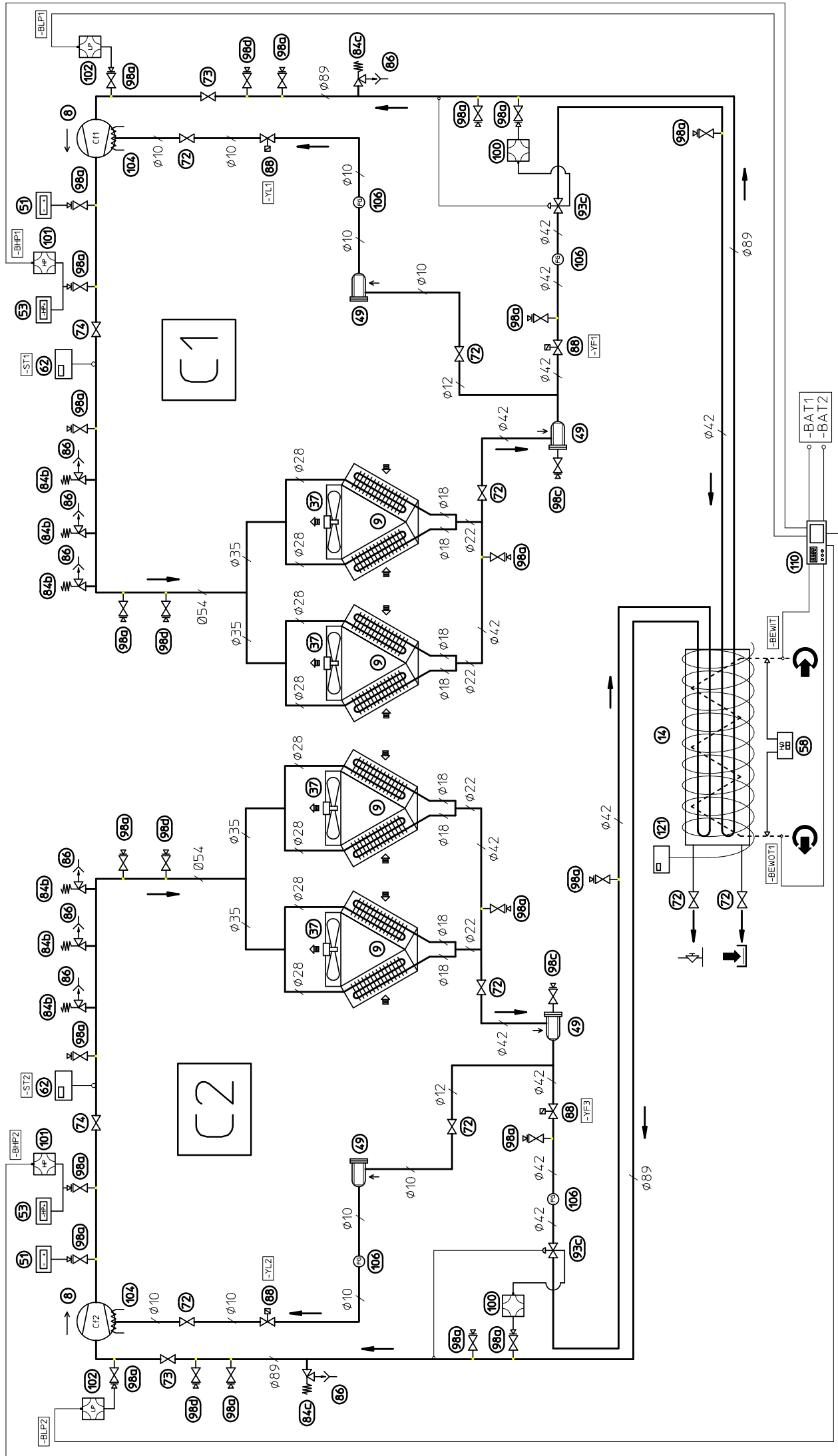
[illegible]

	FIRMA	SIGNATURE		
			I	I



DENOMINAZIONE DENOMINATION
PNP 280/SN
DIMENSIONI INGOMBRO
OVERALL DIMENSIONS
DIMENSIONS ENCOMBREMENT
ABMESSUNGEN
DIMENSIONS TOTALES

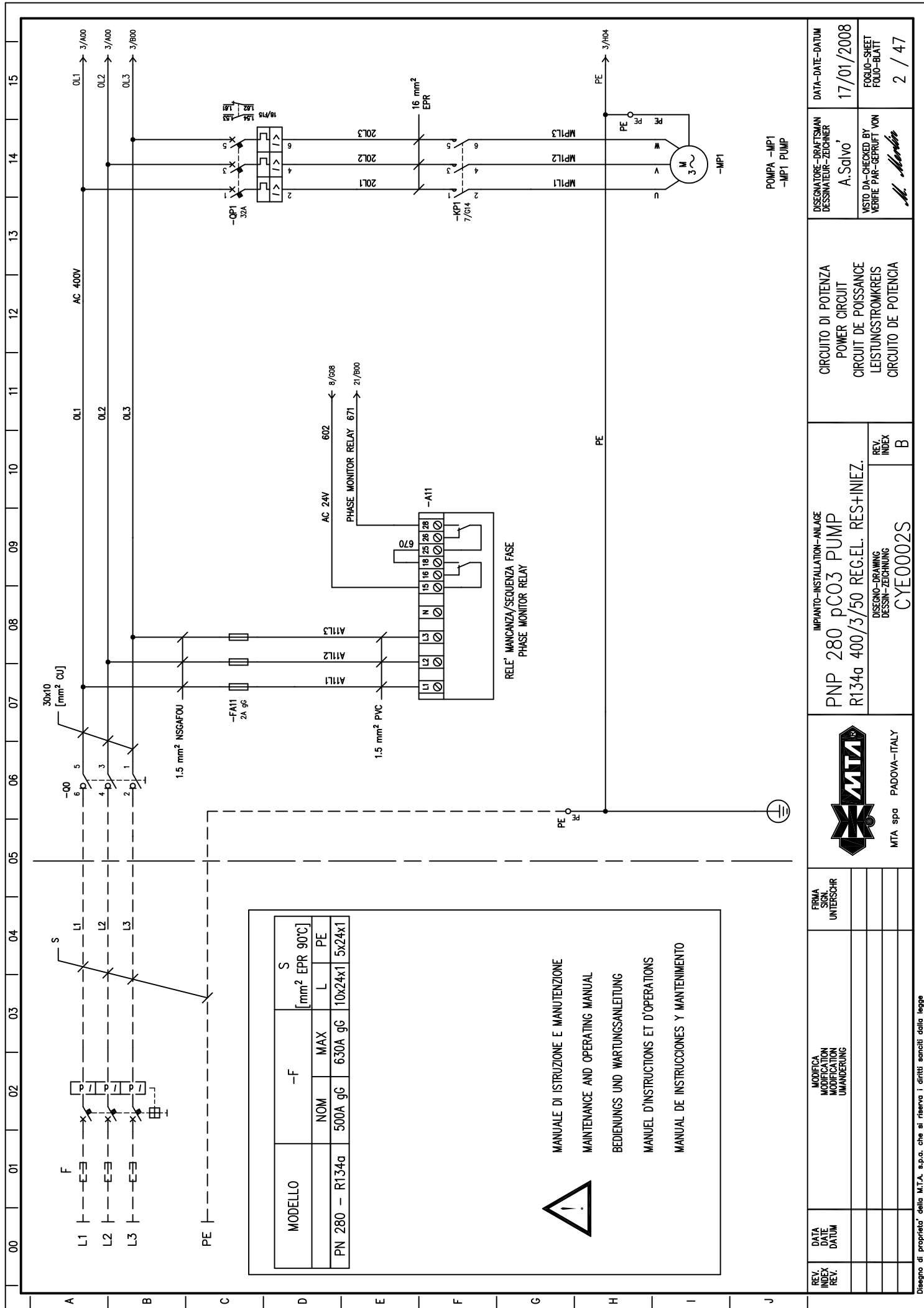
VISTO DA CHECKED BY <i>Cesariotto S</i>	DISEGNO DRAWING CYD0002S	REV. INDEX A	FOGLIO SHEET 1 / 1
--	-----------------------------	-----------------	-----------------------

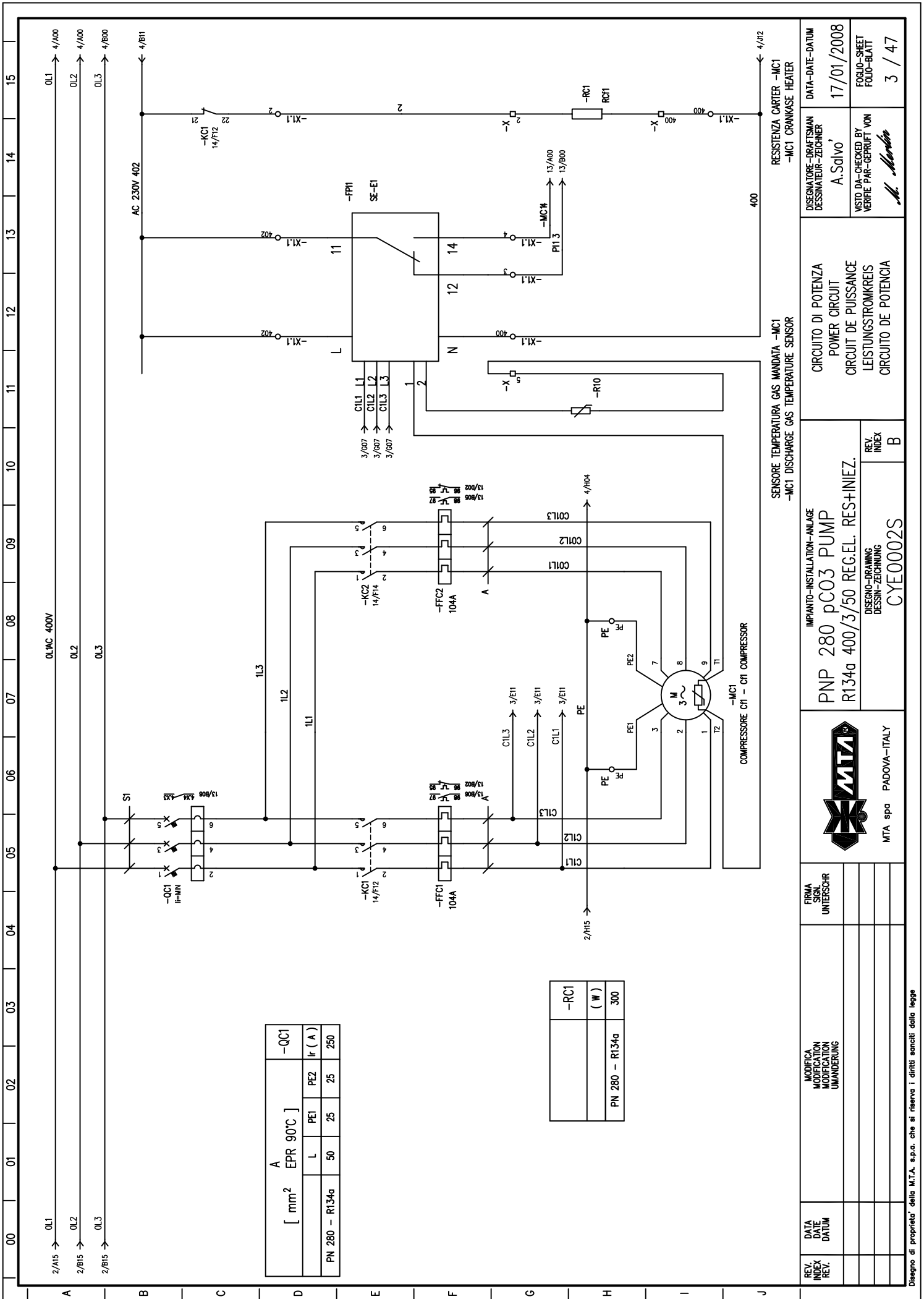


REVISIONE	INDEX	DENOMINAZIONE	DATA	SIGNATURE	DATA DATE	REV. INDEX	FOGLIO SHEET
-	-	PNP 280 SN SCHEMA FRIGO REFRIGERATOR DIAGRAM SCHEMA FRIGO KALTESCHEMA ESQUEMA FRIGO	-	-	29/01/2008	A	1 / 2
DISEGNATORE DRAFTSMAN CALORE L.			VISTO DA CHECKED BY <i>Cesarotto S.</i>		CYF0002S		
DISEGNO DRAWING			SCALE		CYF0002S		
MTA			MTA S.p.A. PADOVA ITALY		REV. INDEX		
					FOGLIO SHEET		

N°		RIF.		DENOMINAZIONE		BEZEICHNUNG		DENOMINATION		BEZEICHNUNG		DENOMINATION	
8	Cf			COMPRESSORE	KOMPRESSOR	KOMPRESSOR		RESISTENZA CARTER	GEHAEUSEWIDERSTAND	104	RCf		
				COMPRESSOR	COMPRESSOR	COMPRESSOR		CASING RESISTANCE	RESISTENCIA CARTER				
				COMPRESSEUR				INDICATORE DI PASSAGGIO	DURCHFUSSANZEIGER				
9	CdA			CONDENSATORE REFRIGERANTE/ARIA	CONDENSATOR LUFT/KAELEMITTEL	CONDENSADOR REFRIGERANTE/AIRE		PASSAGE INDICATOR	INDICATOR DE PASAJE	106	FG		
14	Ev			CONDENSEUR REFRIGERANT/AIR				INDICATEUR DE PASSAGE		110	Cnf		
				EVAPORATORE A FASCIO	ROHRSCHLANGEN VERDAMPFER			CENTRALINA ELETTRONICA	ELEKTRONISCHE STEUERKARTE				
37	V			SHELL AND COIL EVAPORATOR	EVAPORADOR MULTITUBULAR			CENTRALE ELECTRONIQUE	CENTRALITA ELECTRONICA	121	R		
				EVAPORATEUR A CALANDRE ET SERPENTIN	VENTILATOR	VENTILADOR		RESISTENZA A FILO	HEIZDRAHT				
49	FIRf			FAN				HEATING WIRE	HILO TERMICO				
				VENTILATEUR	KAELEMITTEL FILTER	FILTRO REFRIGERANTE		FL CHAUFFANT					
51	P			REFRIGERANT FILTER									
				FILTRO REFRIGERANT	DRUCKPRESSOSTAT VERSTELLBAR	PRESOSTATO DE PRESION CON CALIBRADO VARIABLE							
53	HP			VARIABLE SETTING PRESSURE SWITCH	PRESSOSTAT DE PRESSION A ETALONNAGE VARIABLE								
				PRESSOSTATO DI ALTA PRESSIONE A TARATURA VARIABLE	HOCHDRUCKPRESSOSTAT VERSTELLBAR	PRESOSTATO DE PRESION ALTA CON CALIBRADO VARIABLE							
				VARIABLE SETTING HIGH PRESSURE SWITCH									
58	PdW			PRESSOSTAT DE PRESSION HAUTE A ETALONNAGE VARIABLE				DIFFERENZPRESSOSTAT WASSER					
				PRESSOSTATO DIFFERENZIALE ACQUA	PRESOSTATO DIFERENCIAL AGUA								
62	Ts			WATER DIFFERENTIAL PRESSURE SWITCH				PRESOSTATO DIFFERENCIAL AGUA					
				PRESSOSTAT DIFFERENTIEL EAU	BETRIEBSTHERMOSTAT	TERMOSTATO DE FUNCIONAMIENTO							
72	-			TERMOSTAT DI FUNZIONAMENTO	OPERATING THERMOSTAT	TERMOSTATO DE FUNCIONAMIENTO							
				THERMOSTAT DE FONCTIONNEMENT									
74	-			RUBINETTO	HAHN	LLAVE							
				COCK									
73	-			RUBINET	LLAVE								
				RUBINETTO DI ASPIRAZIONE	ABSPERRHAHN SAUGSEITING	LLAVE DE ASPIRACION							
84b	WSf			INTAKE COCK									
				RUBINET D'ASPIRATION	ABSPERRHAHN DRUCKSEITING	LLAVE DE ENVIO							
84c	WSf			RUBINETTO DI MANDATA									
				OUTPUT COCK	LLAVE DE ENVIO								
86	-			ROBINET DE DEBIT									
				VALVOLA DI SICUREZZA (ALTA PRESSIONE)	SICHERHEITSVENTIL (NIEDERDRUCK)	VALVULA DE VENTEO (PRESION ALTA)							
88	Ws			SAFETY VALVE (HIGH PRESSURE)									
				VANNE DE SECURITE (PRESSION HAUTE)									
93c	Wt			VALVOLA DI SICUREZZA (BASSA PRESSIONE)	SICHERHEITSVENTIL (HOCHDRUCK)	VALVULA DE VENTEO (PRESION BAJA)							
				SAFETY VALVE (LOW PRESSURE)									
98a	-			VANNE DE SECURITE (PRESSION BASSE)									
				SCARGO APERTO	ABLASS OFFEN	DESCARGA ABIERTA							
98b	-			OPEN DRAIN									
				PURGE OUVERTE									
98c	-			SOLENOID VALVE	MAGNETVENTIL								
				VANNE SOLENOIDE	VALVOLA SOLENOIDE	VALVULA SOLENOIDE							
98d	-			VALVOLA TERMOSTATICA (CHILLER)	THERMOSTATVENTIL (KULER)	VALVULA TERMOSTATICA (REFRIGERADOR)							
				THERMOSTATIC VALVE (CHILLER)									
100	TrP			VANNE TERMOSTATIQUE (REFROIDISSEUR)	VALVOLA TERMOSTATICA (REFRIGERADOR)								
				VALVOLA SCHRADER	SCHRADER-VENTIL	VALVULA SCHRADER							
101	TrHP			SCHRADER VALVE	VALVOLA SCHRADER								
				VANNE SCHRADER									
102	TrLP			VALVOLA SCHRADER (VUOTO/CARICA)	SCHRADER-VENTIL (ZUM FULLEN/ENTLEEREN)	VALVULA SCHRADER (VACIO/CARGA)							
				SCHRADER VALVE (VACUUM/CHARGE)									
102	-			VANNE SCHRADER (VIDE/CHARGE)	VALVOLA SCHRADER (VACIO/CARGA)								
				VALVOLA SCHRADER PER COLLAUDO	SCHRADER-PRUFUNGSVENTIL	VALVULA SCHRADER PAR PRUEBA							
102	-			SCHRADER TEST VALVE	VALVULA SCHRADER PAR PRUEBA								
				VANNE SCHRADER POUR ESSAI									
102	-			TRASDUTTORE DI PRESSION	MEBWERTGEBERSDRUCK	NIEDERMERWERTGEBERSDRUCK							
				PRESSURE TRANSDUCER	TRASDUCTOR DE PRESION	TRASDUCTOR DE PRESION BAJA							
102	-			TRASDUCTEUR DE PRESSION	HOCHMEBWERTGEBERSDRUCK	TRASDUCTOR DE PRESION ALTA							
				TRASDUTTORE DI ALTA PRESSIONE									
102	-			HIGH PRESSURE TRANSDUCER	TRASDUCTOR DE PRESION ALTA								
				TRASDUCTEUR DE PRESSION HAUTE									
102	-			TRASDUTTORE DI BASSA PRESSIONE	NIEDERMERWERTGEBERSDRUCK	TRASDUCTOR DE PRESION BAJA							
				LOW PRESSURE TRANSDUCER									
102	-			TRASDUCTEUR DE PRESSION BASSE	TRASDUCTEUR DE PRESSION BASSE								
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
102	-												
10													

[illegible]

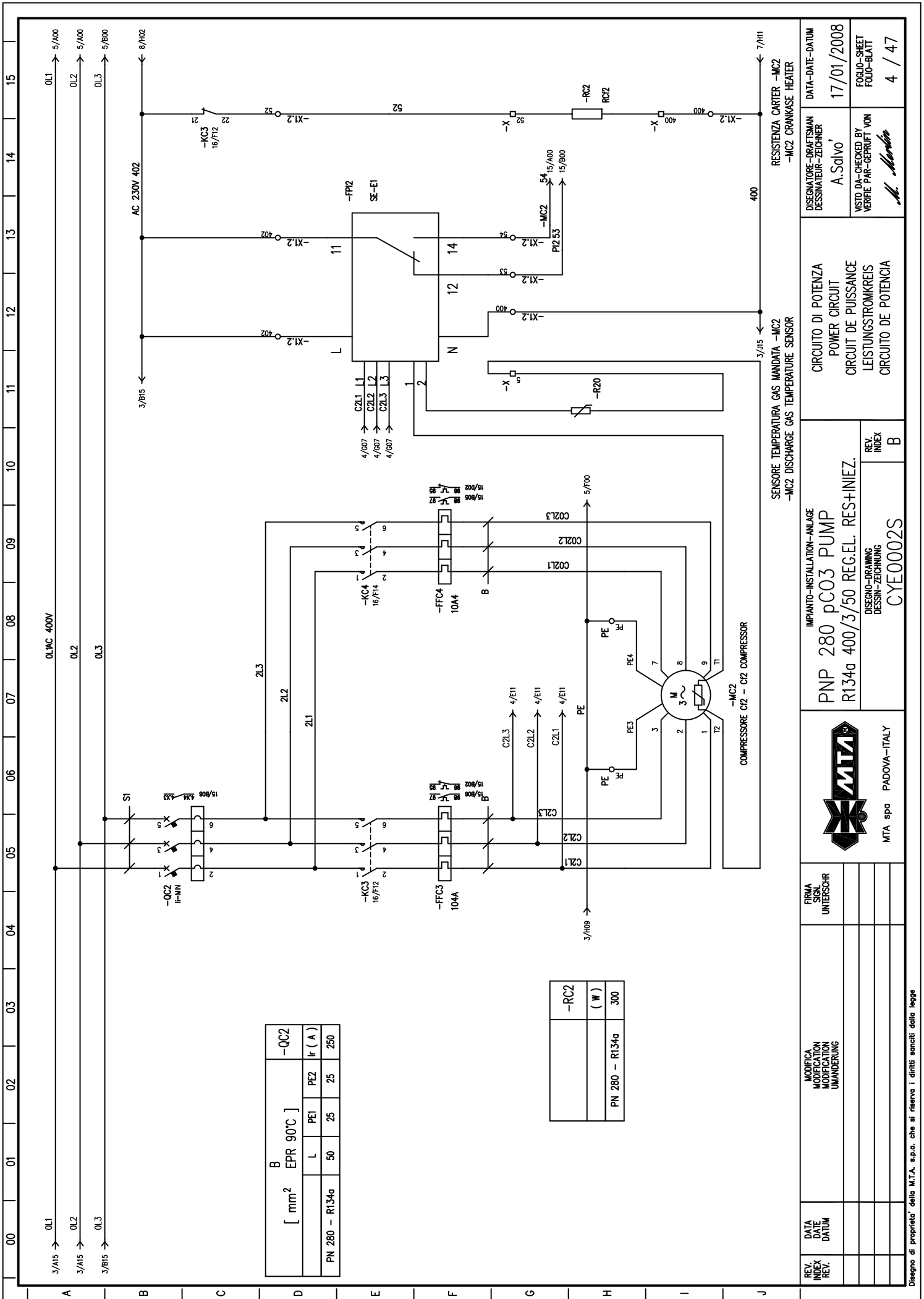






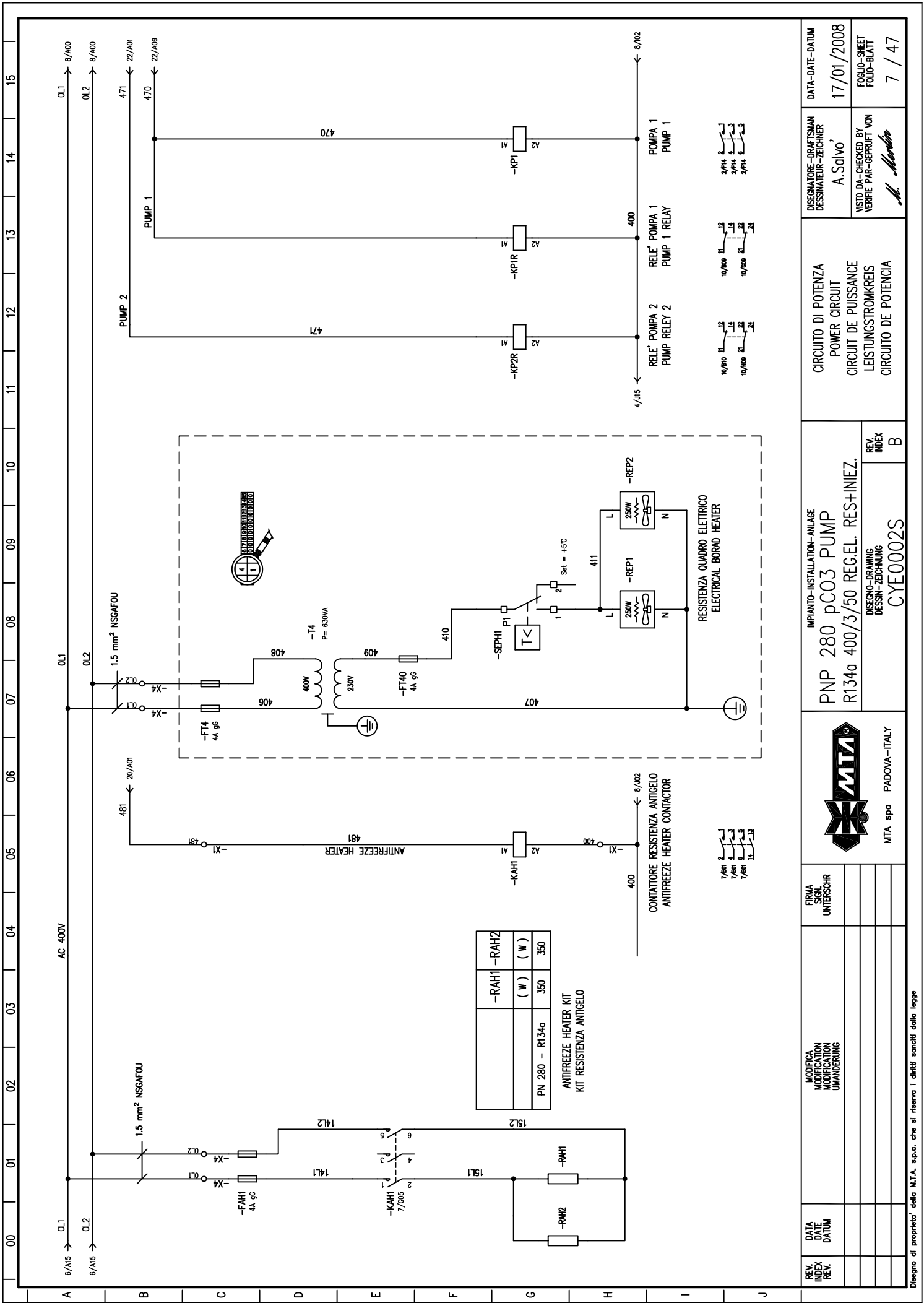
A					-QC1
[mm ² EPR 90°C]					
	L	PE1	PE2	Ir (A)	
PN 280 - R134a	50	25	25	250	

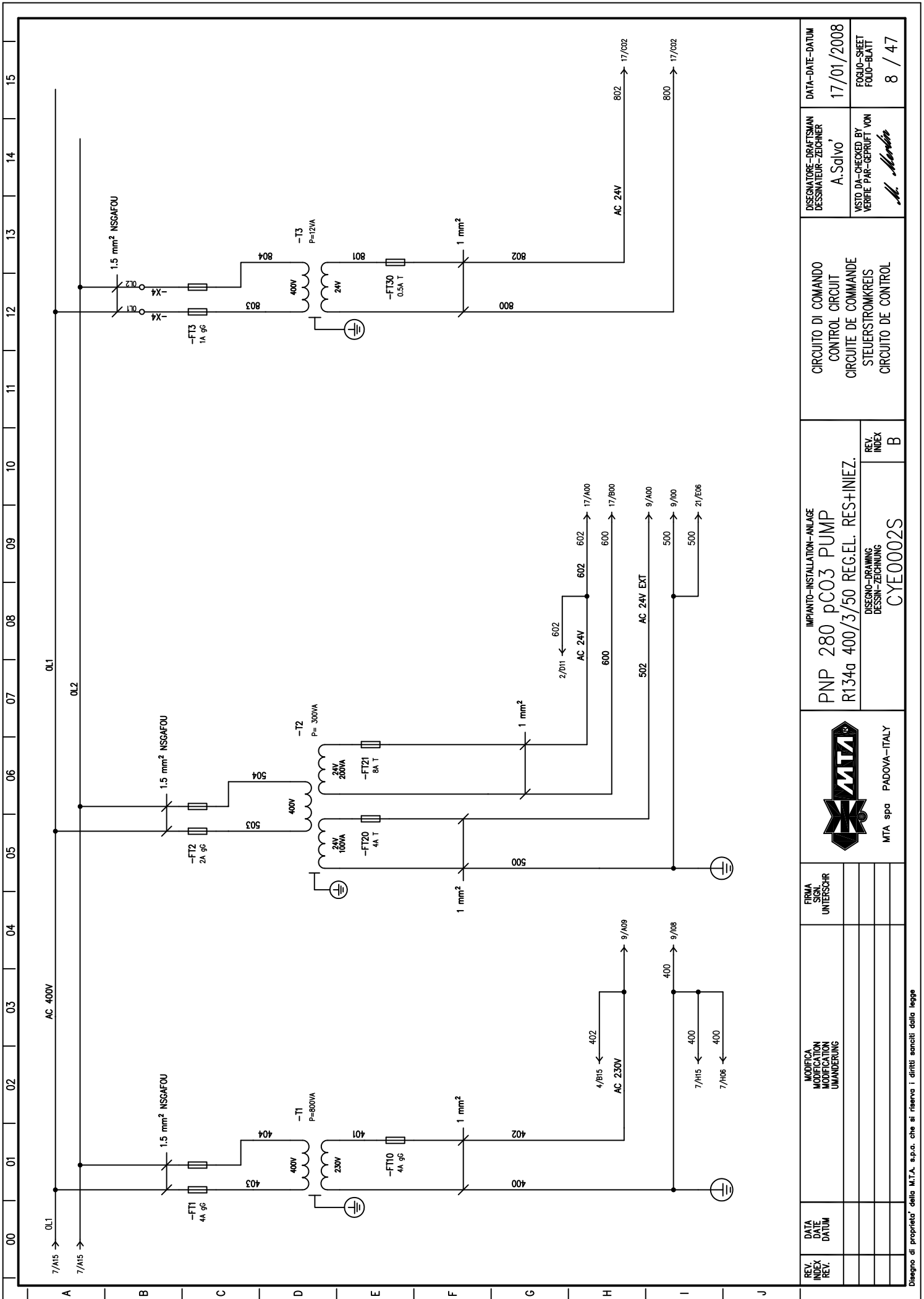
-RC1
(W)
PN 280 - R134a
300



REV. INDEX	DATA DATE DATUM	MODIFICA MODIFICATION UMÄNDERUNG	FIRMA SIGN UNTERSCHR	IMPIANTO-INSTALLATION-ANLAGE PNP 280 pCO3 PUMP R134a 400/3/50 REG.EL. RES+INIEZ.	SENORE TEMPERATURA GAS MANDATA -MC1 -MC1 DISCHARGE GAS TEMPERATURE SENSOR	CIRCUITO DI POTENZA POWER CIRCUIT CIRCUIT DE PUISSANCE LEISTUNGSTROMKREIS CIRCUITO DE POTENCIA	DESIGN-DRAWING DESSIN-ZEICHUNG C/E0002S	DESIGNATORE-DRAFTSMAN DESSINATEUR-ZEICHNER A.Silvo'	DATA-DATE-DATUM 17/01/2008
								VERIFIED BY VERIFIE PAR-GEPRÜFT VON M. Martin	FOLIO-SHEET FOLIO-BLATT 3 / 47

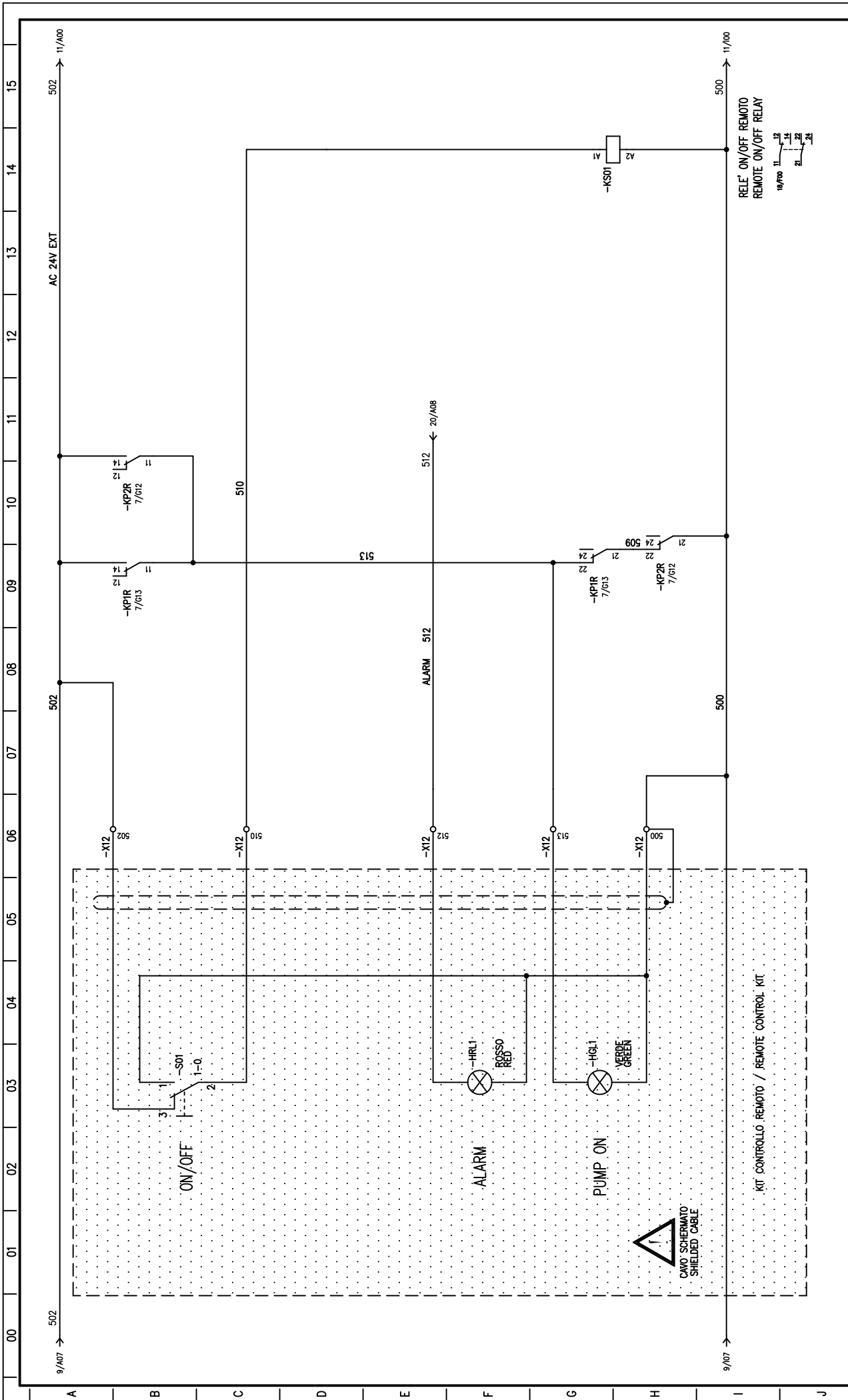


REV. INDEX	DATA DATE DATUM	MODIFICA MODIFICATION UMWANDLUNG	FIRMA SIGN. UNTERSCHR.	 MTA spa PADOVA-ITALY	IMPIANTO-INSTALLATION-ANLAGE PNP 280 pCO3 PUMP R134a 400/3/50 REGEL. RES+INIEZ.	DESIGN-DRAWING DESSIN-ZEICHNUNG CYE0002S	REV. INDEX B	CIRCUITO DI POTENZA POWER CIRCUIT CIRCUIT DE PUISSANCE LEISTUNGSTROMKREIS CIRCUITO DE POTENCIA	DESIGNATORE-DRAFTSMAN DESSINATEUR-ZEICHNER A. Salvo'	DATA-DATE-DATUM 17/01/2008
									VISTO DA-CHECKED BY VERIFIE PAR-GEPRÜFT VON 	FOLIO-SHEET FOLIO-BLATT 4 / 47



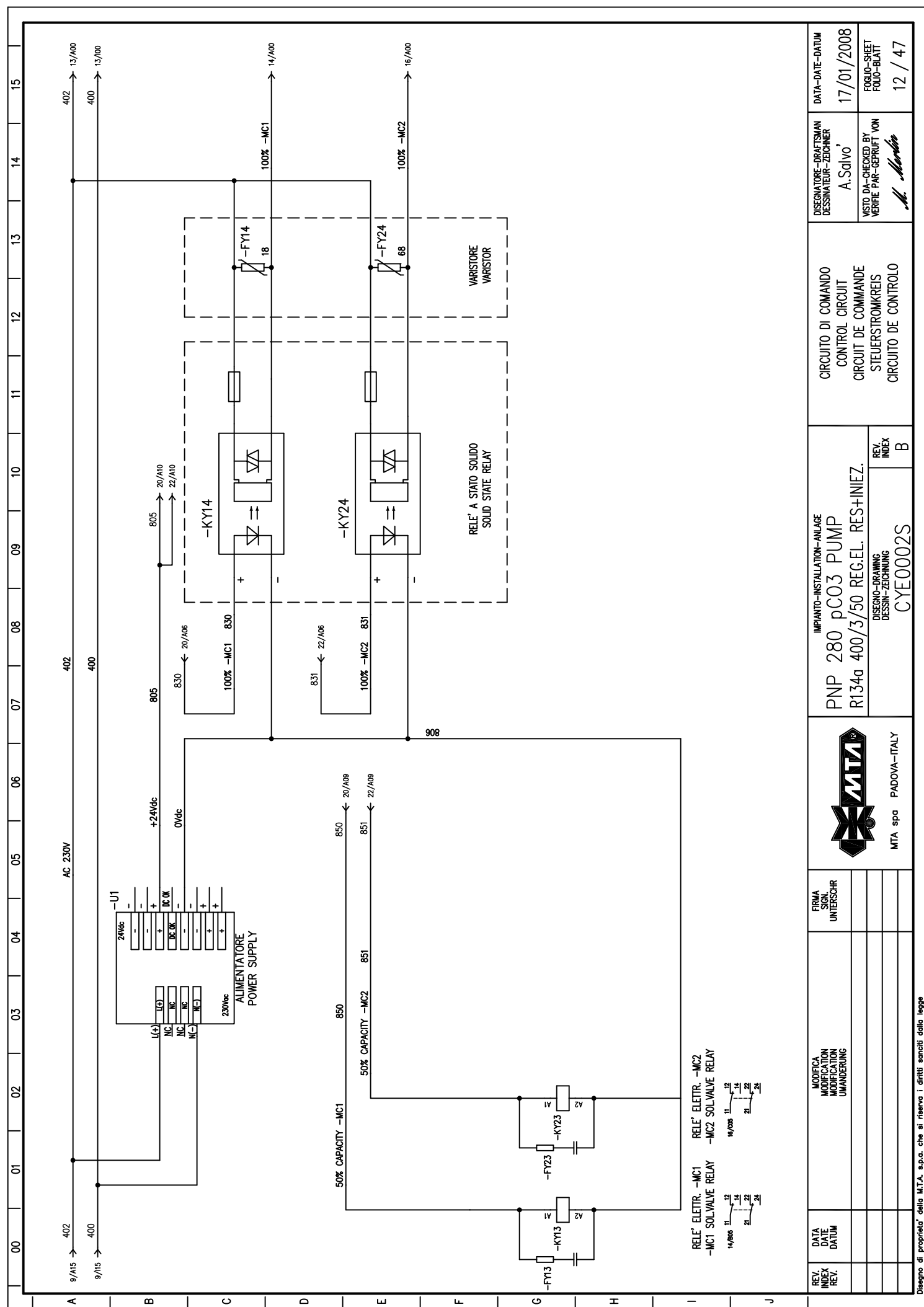


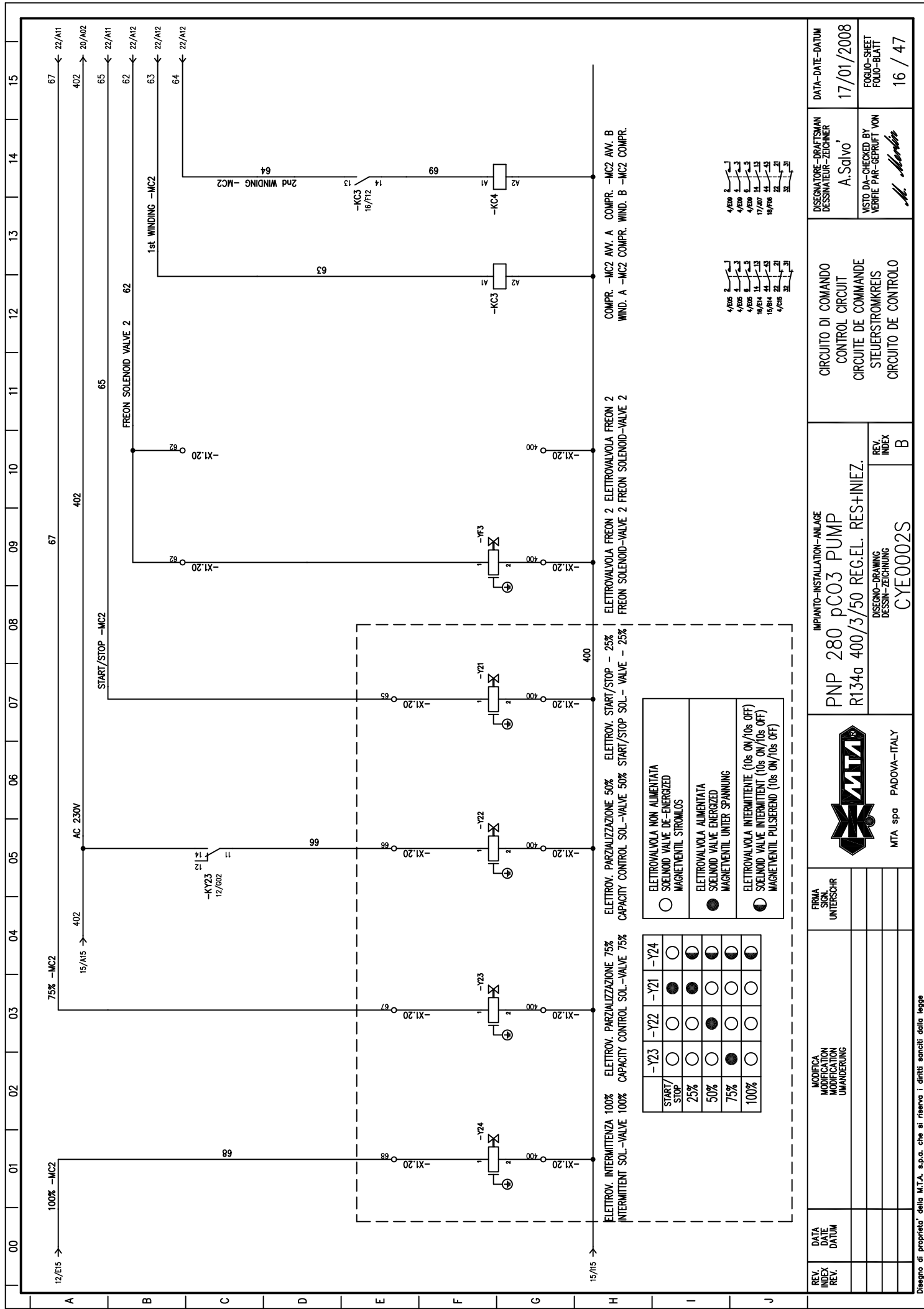
REV. INDEX	DATA DATE DATUM	MODIFICA MODIFICATION UMÄNDERUNG	FIRMA SIGN UNTERSCHR	 MTA spa PADOVA-ITALY	IMPIANTO-INSTALLATION-ANLAGE PNP 280 pCO3 PUMP R134a 400/3/50 REGEL. RES+INIEZ.	CYEO002S	DESIGN-DRAWING DESSIN-ZEICHNUNG	REV. INDEX B	CIRCUITO DI COMANDO CONTROL CIRCUIT CIRCUITE DE COMMANDE STEUERSTROMKREIS CIRCUITO DE CONTROL	DESIGNATORE-DRAFTSMAN DESSINATEUR-ZEICHNER A. Salvo'	DATA-DATE-DATUM 17/01/2008
										VISTO DA-CHECKED BY VERIFIE PAR-GEPRÜFT VON 	FOLIO-SHEET FOLIO-BLATT 8 / 47

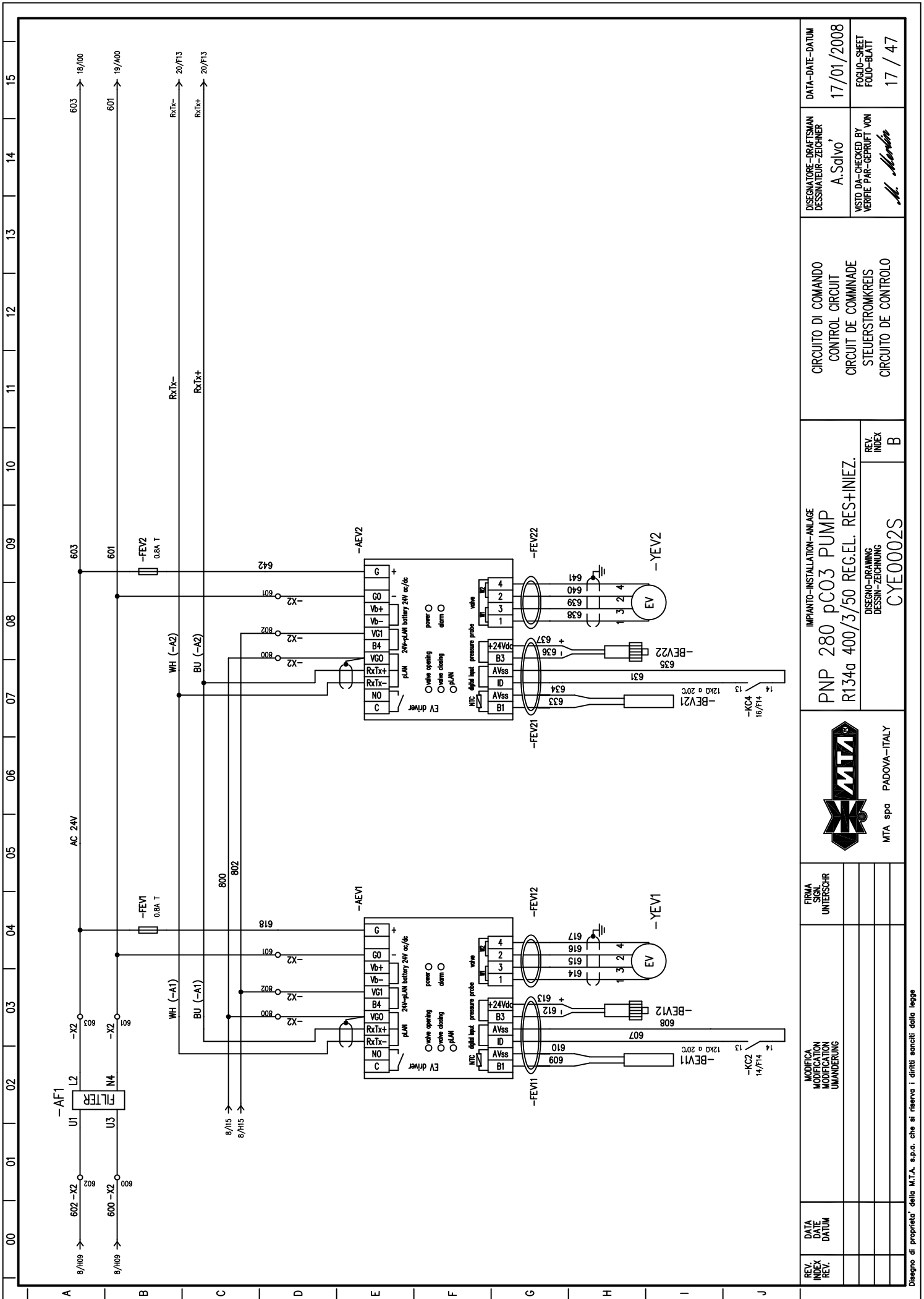


REV. INDEX	DATA DATE DATUM	MODIFICA MODIFICATION ÄNDERUNG	FIRMA SIGN UNTERSCHR	IMPIANTO-INSTALLATION-ANLAGE PNP 280 pCO3 PUMP R134a 400/3/50 REGEL. RES+INIEZ.	CIRCUITO DI COMANDO CONTROL CIRCUIT CIRCUIT DE COMMANDE STEUERSTROMKREIS CIRCUITO DE CONTROLLO	DISEGNATORE-DRAFTSMAN DESSINATEUR-ZEICHNER A. Salvo'	DATA-DATE-DATUM 17/01/2008
				DISEGNO-DRAWING DESSIN-ZEICHNUNG C/E0002S		VISTO DA-CHECKED BY VERIFIE PAR-GEPRÜFT VON <i>M. Martin</i>	FOLIO-SHEET FOLIO-BLATT 10 / 47

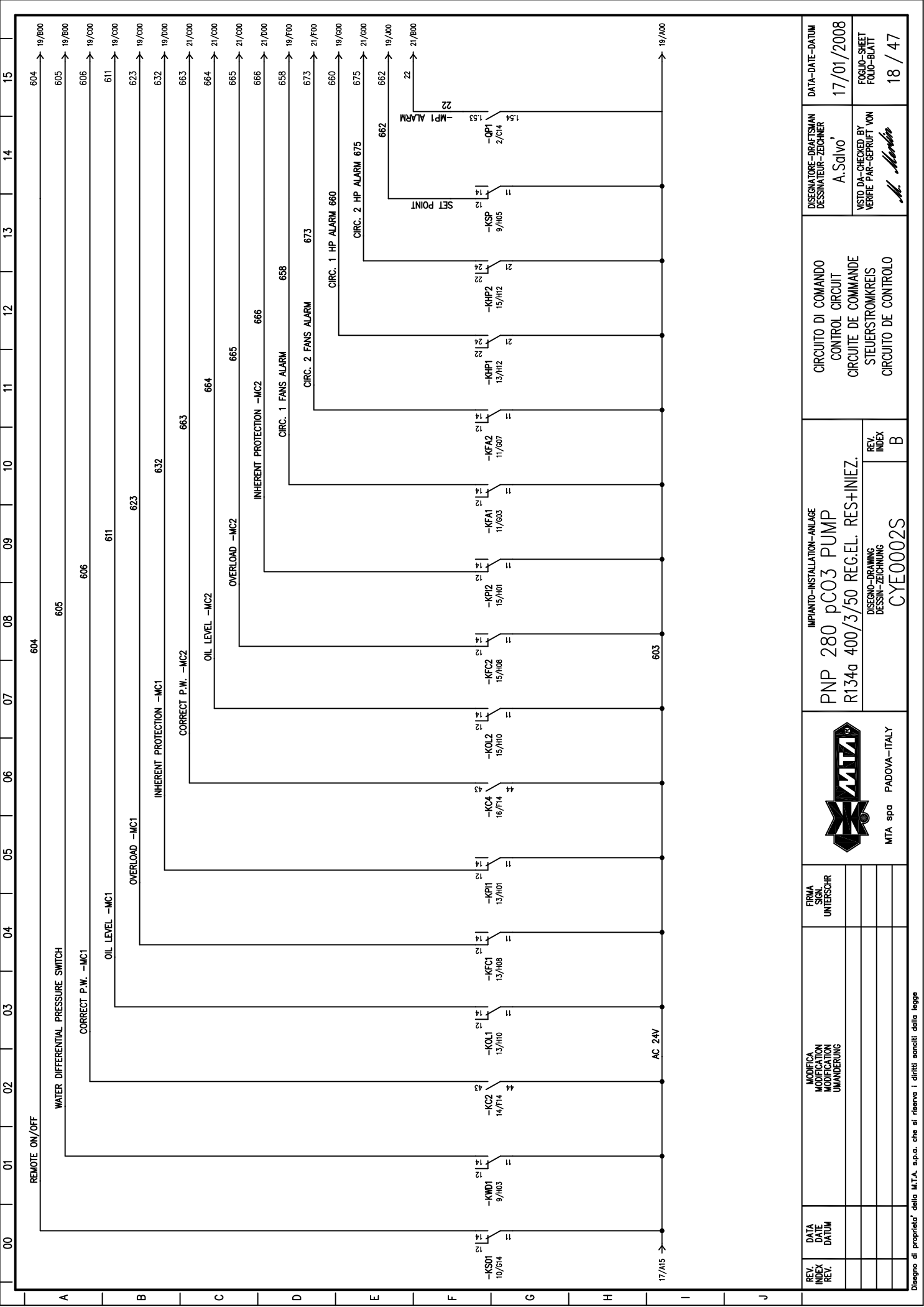




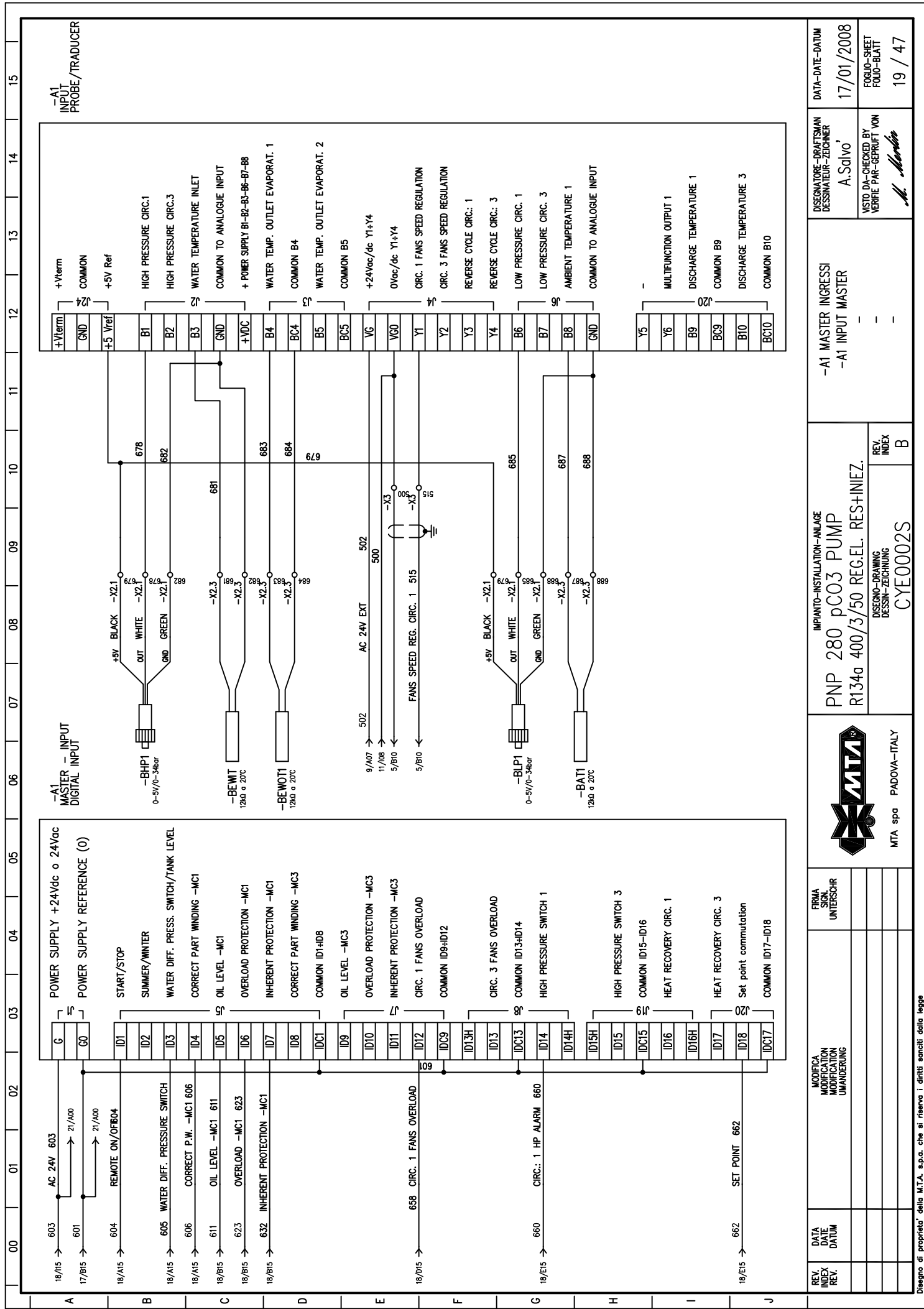


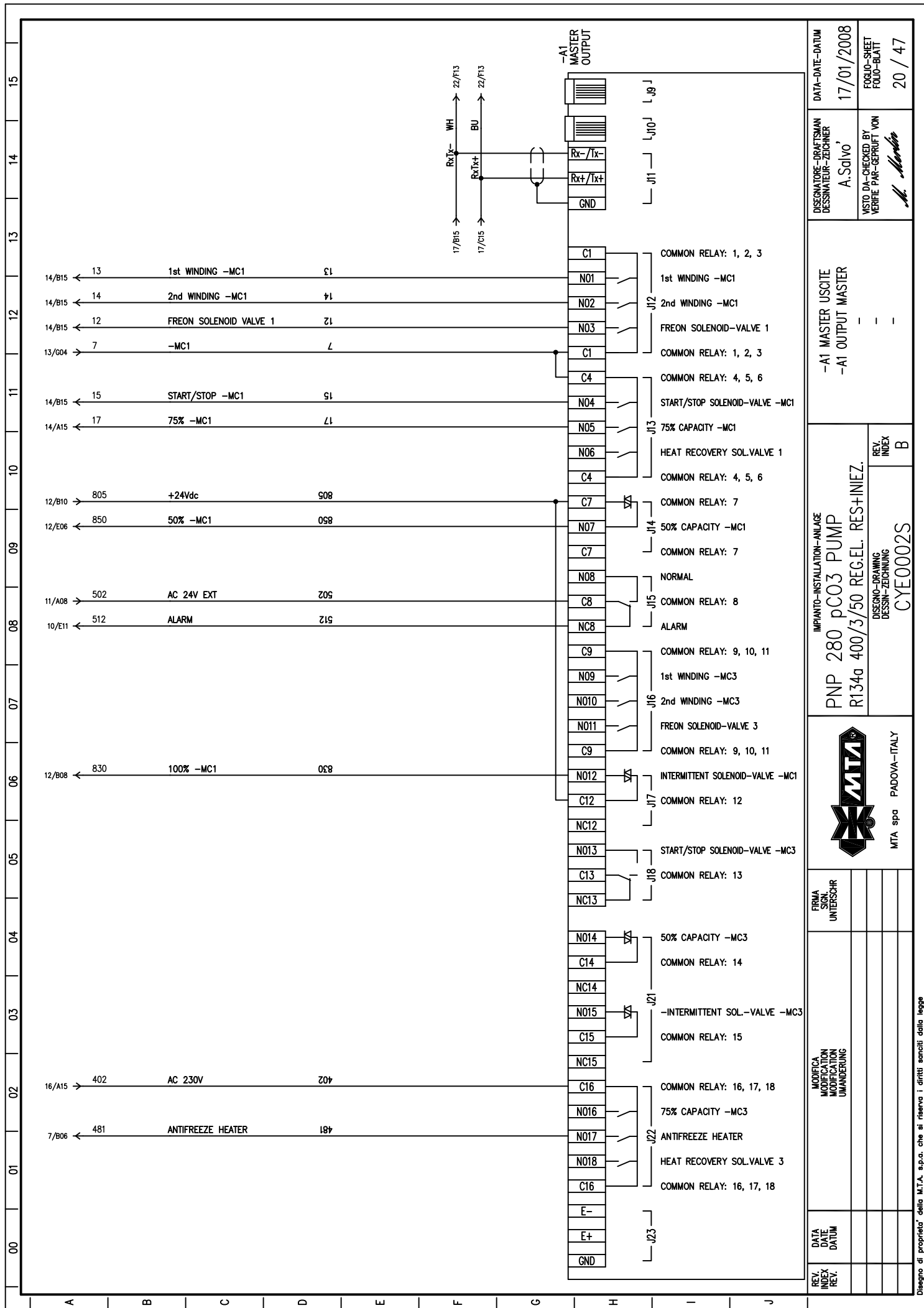


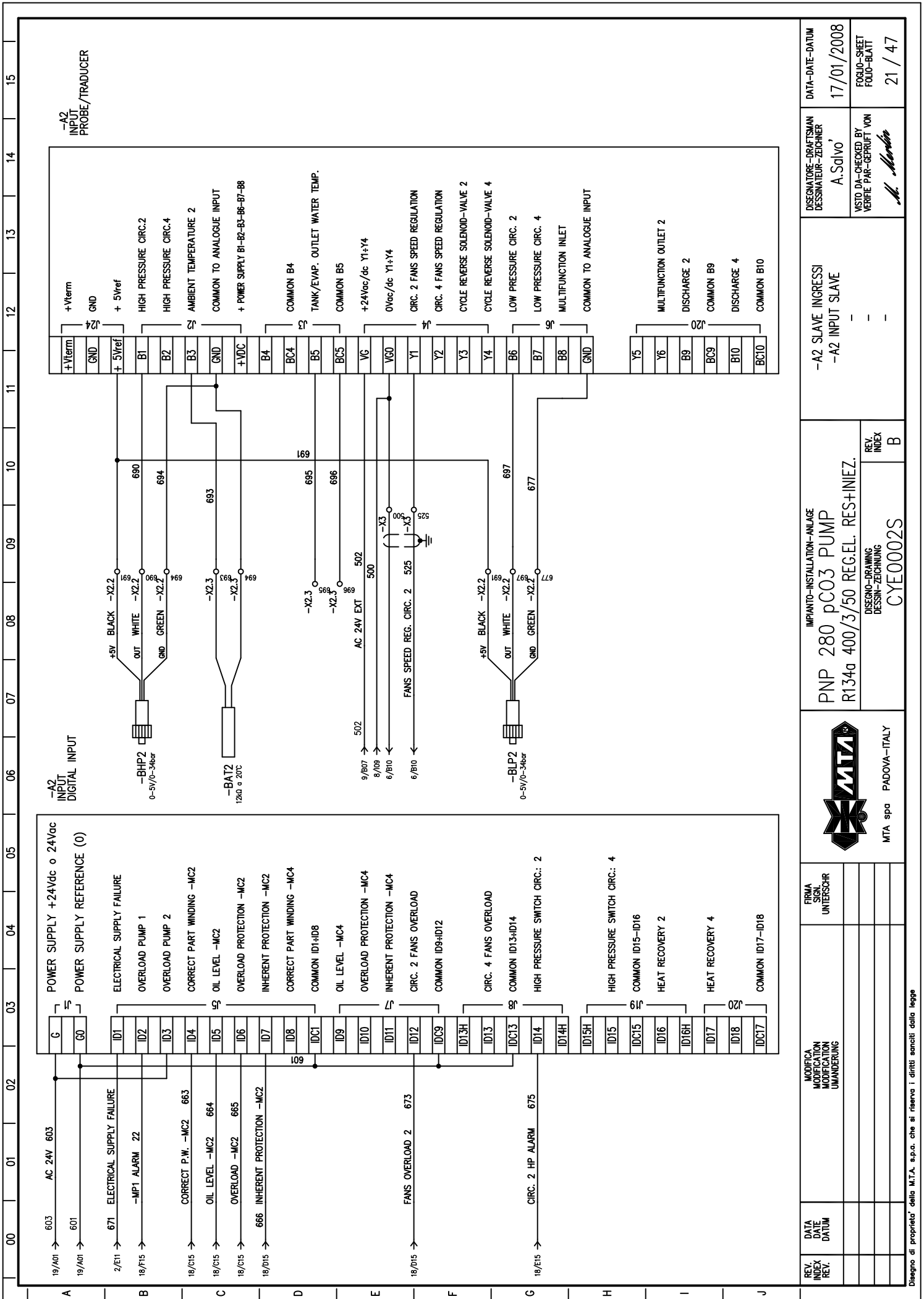
REV. INDEX	DATA DATE DATUM	MODIFICA MODIFICATION UNÄNDERUNG	FIRMA SIGN UNTERSCHR	MTA	IMPianto-Installation-Anlage PNP 280 pCO3 PUMP R134a 400/3/50 REGEL. RES+INIEZ.	CIRCUITO DI COMANDO CONTROL CIRCUIT CIRCUIT DE COMMANDE STEUERSTROMKREIS CIRCUITO DE CONTROL	DESIGN-DRAWING DESSIN-ZEICHUNG C/E0002S	DESIGNATORE-DRAFTSMAN DESSINATEUR-ZEICHNER A. Salvo'	DATA-DATE-DATUM 17/01/2008
				MTA spa PADOVA-ITALY				VERIFIED BY VERIFIE PAR-GEPRÜFT VON M. Martin	FOLIO-SHEET FOLIO-BLATT 17 / 47



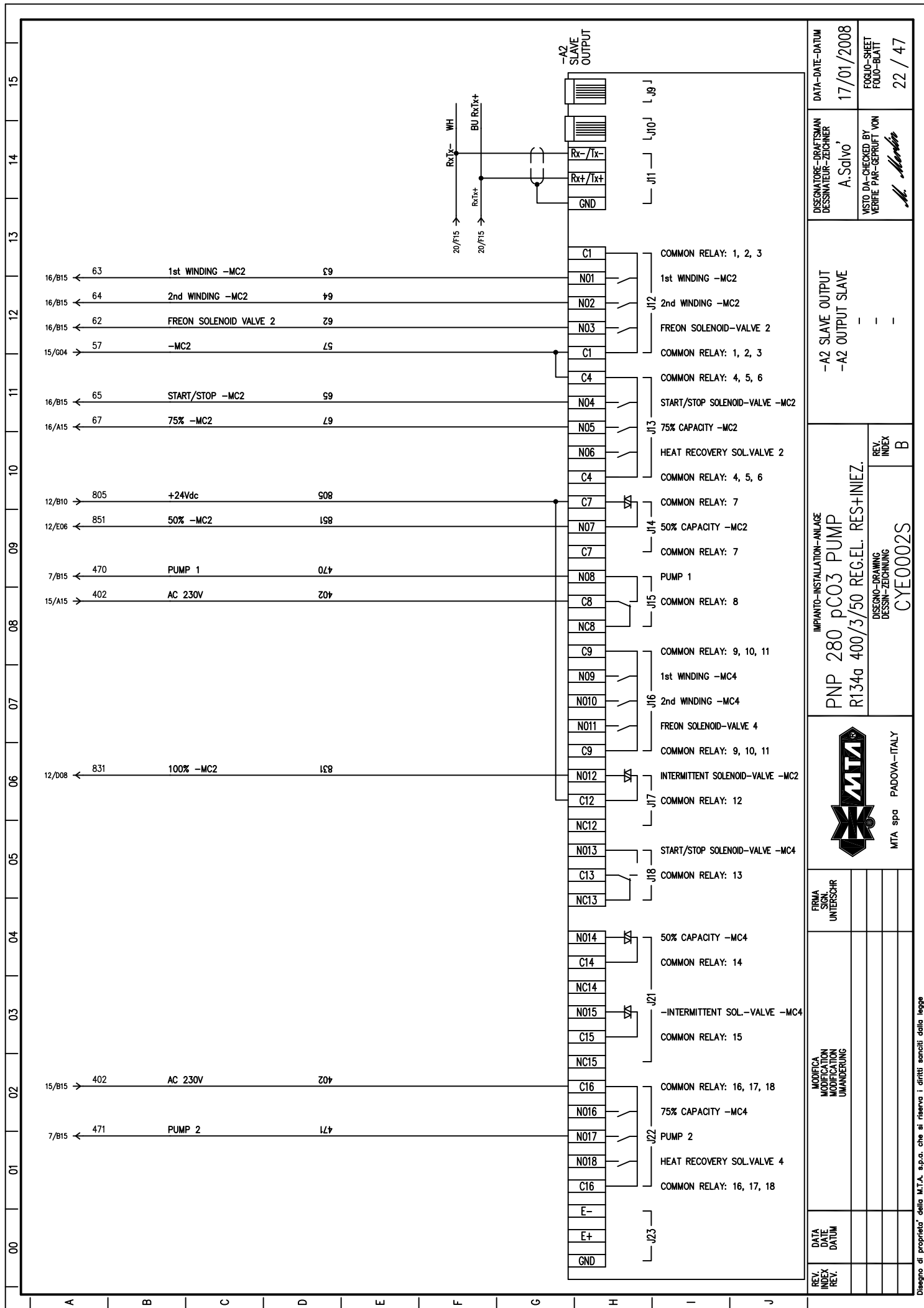
REV. INDEX	DATA DATE DATUM	MODIFICA MODIFICATION UMWANDERUNG	FIRMA SIGN. UNTERSCHR.	IMPIANTO-INSTALLATION-ANLAGE PNP 280 pCO3 PUMP R134a 400/3/50 REGEL. RES+INIEZ.	CIRCUITO DI COMANDO CONTROL CIRCUIT CIRCUITE DE COMMANDE STEUERSTROMKREIS CIRCUITO DE CONTROLO	DESIGNATORE-DRAFTSMAN DESSINATEUR-ZEICHNER A. Salvo'	DATA-DATE-DATUM 17/01/2008
				REV. INDEX B		VERIFIED BY VERIFIE PAR-GEPRÜFT VON M. Martin	FOLIO-SHEET FOLIO-BLATT 18 / 47
				DESIGN-DRAWING DESSIN-ZEICHNUNG CYE0002S			
				MTA spa PADOVA-ITALY			







REV. INDEX	DATA DATE DATUM	MODIFICA MODIFICATION MODIFICATION UNAMENDUNG	FIRMA SIGNATURE UNTERSCHR	IMPIANTO-INSTALLATION-ANLAGE PNP 280 pCO3 PUMP R134a 400/3/50 REGEL. RES+INIEZ.	-A2 SLAVE INGRESSI -A2 INPUT SLAVE	DESIGN-DRAWING DESSIN-ZEICHNUNG CYE0002S	DESIGN-DRAFTSMAN DESSINATEUR-ZEICHNER A.Silvo	DATA-DATE-DATUM 17/01/2008
							VERIFIED BY VERIFIE PAR-GEPRÜFT VON M. Martin	FOGLO-SHEET FOLIO-BLATT 21 / 47



DATA-DATE-DATUM
17/01/2008

DESIGN-TORE-DRAFTSMAN
DESSINATEUR-ZEICHNER
A.Salvo'

REV. DA-CHECKED BY
VERIFIE PAR-GEPRÜFT VON
M. Martin

-A2 SLAVE OUTPUT
-A2 OUTPUT SLAVE

IMPIANTO-INSTALLATION-ANLAGE
PNP 280 pCO3 PUMP
R134a 400/3/50 REGEL. RES+INIEZ.
DESIGN-DRAWING
DESSIN-ZEICHNUNG
CYE0002S

REV. INDEX
B




MTA spa PADOVA-ITALY

FIRMA
SIGN
UNTERSCHR

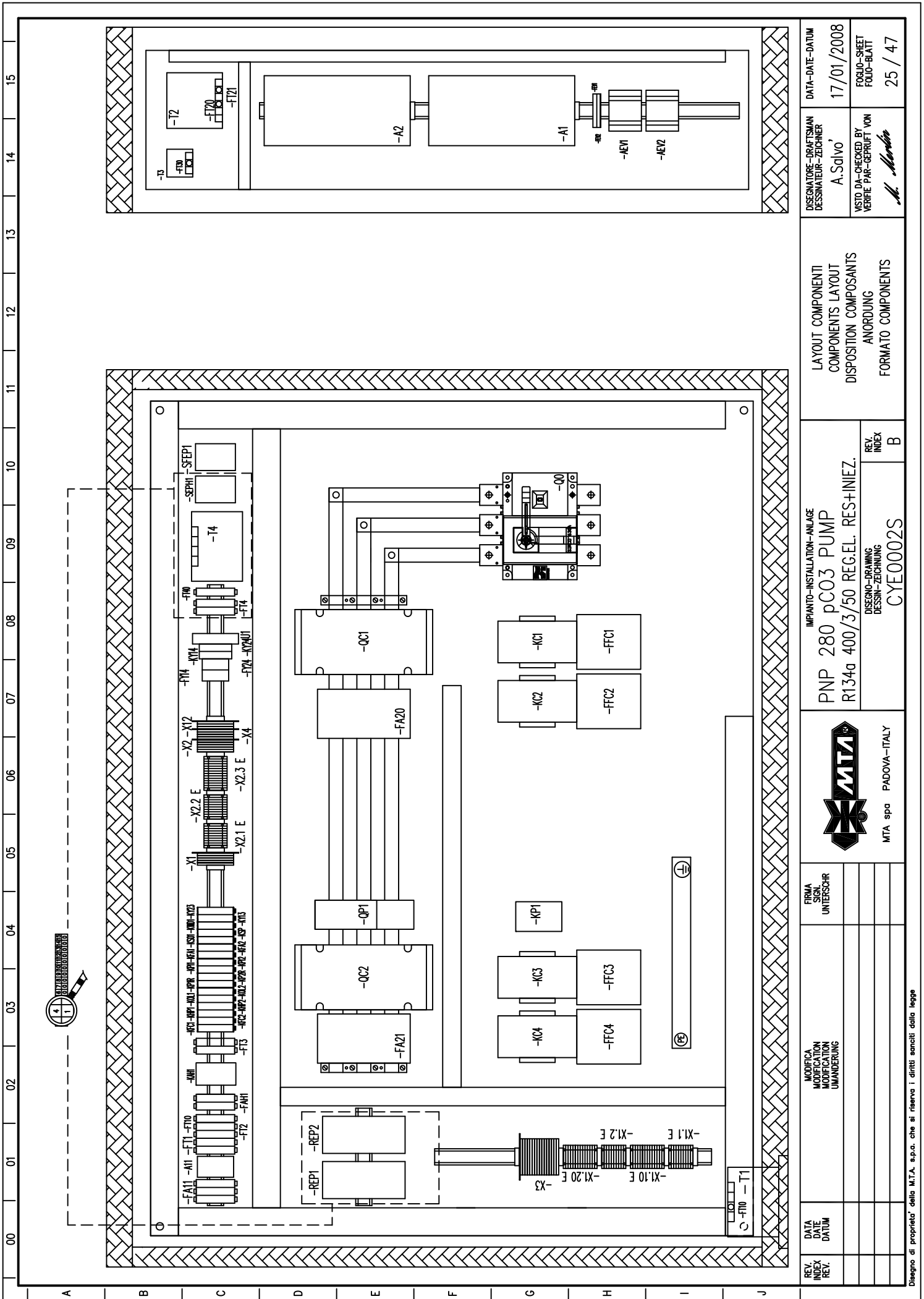
MODIFICA
MODIFICATION
UMÄNDERUNG

DATA
DATE
DATUM

[illegible]

REV. INDEX REV.	DATA DATE DATUM	MODIFICA. MODIFICATION MODIFICATION UNÄNDERUNG	FIRMA SIGN. UNTERSCHR.	 MTA spa PADOVA-ITALY	IMPIANTO-INSTALLATION-ANLAGE PNP 280 pCO3 PUMP R134a 400/3/50 REG.EL. RES+INIEZ.	MORSETTIERA TERMINAL BLOCKS BORNE ANSCHLUßKASTEN BLOQUEO DE TERMINALES	DESIGNATORE-DRAFTSMAN DESSINATEUR-ZEICHNER A.Salvo	DATA-DATE-DATUM 17/01/2008
							VISTO DA-CHECKED BY VERKEHRT-GEPRÜFT VON <i>M. Morsetti</i>	FOLIO-SHEET FOLIO-BLATT 23 / 47
							DESIGNO-DRAWING DESSIN-ZEICHNUNG CYF0002S	
							REV. INDEX B	

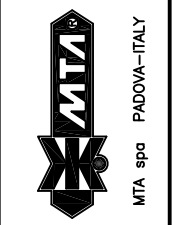
CONDUTTORI		Identif. Conduttore	Sezione mm²	- X1.1 E		- X1.10 E		- X1.2 E		- X1.20 E		- X2.1 E		- X2.2 E		- X2.3 E																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
				3/D15	3	3/G12	4	3/G13	3/H15	3/G12	3/D13	3/D13	9	13/C11	10	13/D13	11	13/G14	12	14/E07	15	14/E05	16	14/E03	17	14/E01	18	14/G10	13/A13	PE	4/D15	53	4/G13	4/H15	400	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	402	4



DESIGNATOR-DRAFTSMAN DESSINATEUR-ZEICHNER A.Silvo'	DATA-DATE-DATUM 17/01/2008
VISTO DA-CHECKED BY VERIFIE PAR-GEPRÜFT VON <i>M. Martin</i>	FOLIO-SHEET FOLIO-BLATT 25 / 47

LAYOUT COMPONENTI
COMPONENTS LAYOUT
DISPOSITION COMPOSANTS
ANORDNUNG
FORMATO COMPONENTS

IMPIANTO-INSTALLATION-ANLAGE PNP 280 pCO3 PUMP R134a 400/3/50 REG.EL. RES+INIEZ.	REV. INDEX B
DESIGNO-DRAWING DESSIN-ZEICHNUNG CYE0002S	



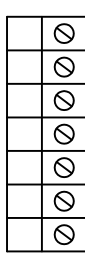
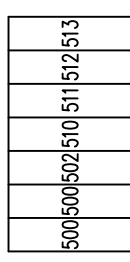
REV. INDEX REV.	DATA DATE DATUM	MODIFICA MODIFICATION UMÄNDERUNG	FIRMA SIGN UNTERSCHR

[illegible]

-X12

-X12

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	-----



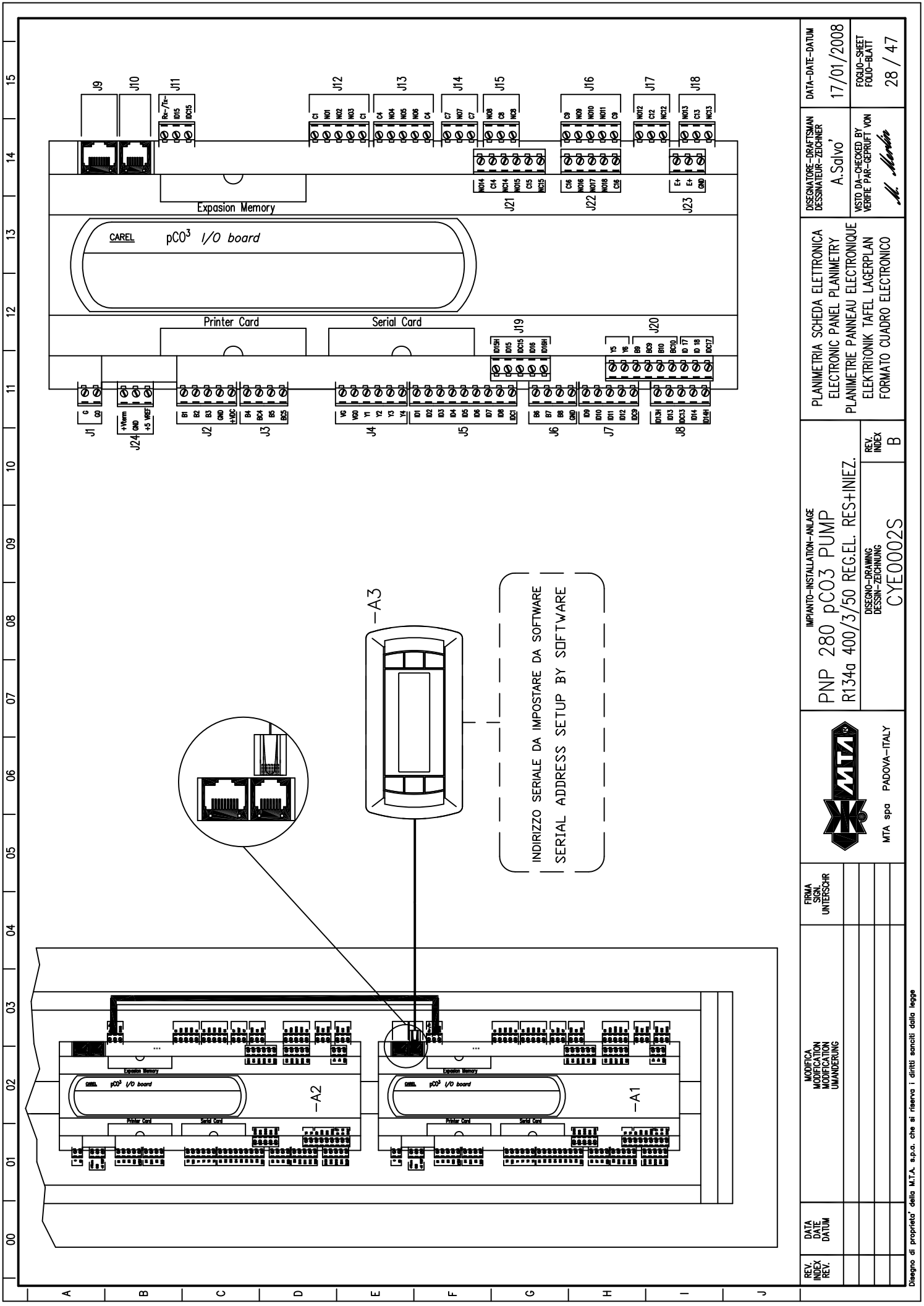
500	502	510	511	512	513
-----	-----	-----	-----	-----	-----

DATA Sperimentale	Modello	Modello	Modello
LUNGH. MASSIMA: 50m, 1mm ²			
LUNGH. MASSIMA: 100m, 1.5mm ²			

SHIELDED CABLE
MAX LENGTH: 50m, 1mm²

STATO LAMPADE LAMP STATUS	STATO UNITA' UNIT STATUS	
—HGL1	—HRL1	
OFF	OFF	MACCHINA IN OFF DA REMOTO; INTERVENTO FUSIBILI UNIT OFF BY REMOTE; FUSES BURNED OUT
ON	OFF	UNITA IN MARCIA; ASSENZA DI ALLARMI UNIT RUNNING; NO ALARM
ON	ON	ALLARME SENZA BLOCCO DELLA POMPA ALARM WITHOUT PUMP STOP
OFF	ON	ALLARME CON BLOCCO DELLA POMPA ALLARME WITH PUMP STOP

Disegno di proprietà* della M.T.A. s.p.a. che si riserva i diritti sanciti dalla legge



REV. INDEX	DATA DATE DATUM	MODIFICA MODIFICATION ÄNDERUNG	FIRMA SIGNATURE UNTERSCHR	IMPIANTO-INSTALLATION-ANLAGE PNP 280 pCO ³ PUMP R134a 400/3/50 REGEL. RES+INIEZ.	PLANIMETRIA SCHEDA ELETTRONICA ELECTRONIC PANEL PLANIMETRY PLANIMETRIE PANNEAU ELECTRONIQUE ELEKTRONIK TAFEL LAGERPLAN FORMATO CUADRO ELECTRONICO	DISEGNATORE-DRAFTSMAN DESSINATEUR-ZEICHNER A. Salvo'	DATA-DATE-DATUM 17/01/2008
				REV. INDEX B		VISTO DA-CHECKED BY VERIFIE PAR-GEPRÜFT VON M. Martin	FOLIO-SHEET FOLIO-BLATT 28 / 47





MTA spa PADOVA-ITALY

[illegible]

[illegible]

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
	INITIALS	POSITION	DENOMINATION													
A	-A1	ELECTRONIC BOARD	INDICATING LAMP													
	-A11	PHASE MONITOR RELAY														
	-A2	SCHEDA ELETTRONICA pCO														
	-A3	DISPLAY														
B	-A20	FANS CONTROL SPEED	COMPRESSOR CONTACTOR													
	-A21	FANS CONTROL SPEED														
	-AF1	FILTER														
	-AEV1	ELECTRONIC BOARD														
C	-AEV2	ELECTRONIC BOARD	COMPRESSOR THERMAL ALARM													
	-BAT1	AMBIENT TEMPERATURE PROBE														
	-BAT2	AMBIENT TEMPERATURE PROBE														
	-BEV11	TEMPERATURE PROBE														
D	-BEV12	PRESSURE TRANSDUCER	HIGH PRESSURE RELAY													
	-BEV21	TEMPERATURE PROBE														
	-BEV22	PRESSURE TRANSDUCER														
	-BEWIT	EVAPORATOR INLET WATER TEMPERATURE PROBE														
E	-BEWOT1	EVAPORATOR OUTLET WATER TEMPERATURE PROBE	PUMP RELAY													
	-BHP1	HIGH PRESSURE TRADUCER														
	-BHP2	HIGH PRESSURE TRADUCER														
	-BLP1	LOW PRESSURE TRADUCER														
F	-BLP2	LOW PRESSURE TRADUCER	ON/OFF RELAY													
	-FA11	—														
	-FA20	CARD FUSE														
	-FA21	CARD FUSE														
G	-FAH1	TRANSFORMER FUSE	SOLENOID VALVE RELAY													
	-FEV1	CARD FUSE														
	-FEV11	—														
	-FEV12	—														
H	-FEV2	CARD FUSE	COMPRESSOR													
	-FEV21	—														
	-FEV22	—														
	-FFC1	OVERLOAD PROTECTION														
I	-FFC2	OVERLOAD PROTECTION	SOLENOID VALVE RELAY													
	-FFC3	OVERLOAD PROTECTION														
	-FFC4	OVERLOAD PROTECTION														
	-FP11	INHERENT PROTECTION														
J	-FP12	INHERENT PROTECTION	STATE SOLID RELAY													
	-FT1	TRANSFORMER FUSE														
	-FT10	TRANSFORMER FUSE														
	-FT2	TRANSFORMER FUSE														
K	-FT20	TRANSFORMER FUSE	COMPRESSOR													
	-FT21	TRANSFORMER FUSE														
	-FT3	TRANSFORMER FUSE														
	-FT30	TRANSFORMER FUSE														
L	-FT4	TRANSFORMER FUSE	SOLENOID VALVE RELAY													
	-FT40	TRANSFORMER FUSE														
	-FY13	RC FILTER														
	-FY14	VARISTOR														
M	-FY23	RC FILTER	STATE SOLID RELAY													
	-FY24	VARISTOR														
	-HGL1	INDICATING LAMP														
	-HGL2	—														

REV. INDEX	DATA DATE	MODIFICA MODIFICATION UMÄNDERUNG	FIRMA SIGN. UNTERSCHR	 MTA spa PADOVA-ITALY		PNP 280 pCO3 PUMP R134a 400/3/50 REG.EL. RES+INIEZ.	IMPIANTO-INSTALLATION-ANLAGE	NOMENCLATURA LEGENDA NOMENKLATURE NOMENKLATURE		DESIGN-DRAWING DESSIN-ZEICHUNG CYE0002S	REV. INDEX B	DISGNATORE-DRAFTSMAN DESSINATEUR-ZEICHNER A.Silvo'	DATA-DATE-DATUM 17/01/2008	FOLIO-SHEET FOLIO-BLATT 32 / 47
												VISTO DA-CHECKED BY VERFIE PAR-GEPRÜFT VON 		

Disegno di proprietà della M.T.A. s.p.a. che si riserva i diritti sanciti dalla legge

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
						</										

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
	SIGLE	POSITION	DENOMINACION						SIGLE	POSITION	DENOMINACION					
A	-A1		CARTE ELECTRONIQUE						-HRL1		LAMPE DE SIGNALISATION					
	-A11		-						-KAH1		-					
	-A2		SCHEDA ELETTRONICA pCO						-KC1		CONTACTEUR COMPRESSEUR					
	-A3		DISPLAY						-KC2		CONTACTEUR COMPRESSEUR					
B	-A20		REGOLATEUR DE VITESSE VENTILATEUR						-KC3		CONTACTEUR COMPRESSEUR					
	-A21		REGOLATEUR DE VITESSE VENTILATEUR						-KC4		CONTACTEUR COMPRESSEUR					
	-AF1		FILTRE						-KFA1		-					
	-AEV1		CARTE ELECTRONIQUE						-KFA2		-					
C	-AEV2		CARTE ELECTRONIQUE						-KFC1		-					
	-BAT1		SONDE TEMPERATURE AMBIENTE						-KFC2		-					
	-BAT2		SONDE TEMPERATURE AMBIENTE						-KHP1		RELAIS HAUTE PRESSION					
	-BEV11		SONDE DE TEMPERATURE						-KHP2		RELAIS HAUTE PRESSION					
D	-BEV12		TRASDUCTEUR DE PRESSION						-KOL1		-					
	-BEV21		SONDE DE TEMPERATURE						-KOL2		-					
	-BEV22		TRASDUCTEUR DE PRESSION						-KP1		CONTACTEUR POMPE					
	-BEWIT		SONDE TEMPERATURE ENTREE EAU EVAPORATEUR						-KP1R		RELAIS POMPE					
E	-BEWOT1		SONDE TEMPERATURE SORTIE EAU EVAPORATEUR						-KP2R		RELAIS POMPE					
	-BHP1		TRASDUCTEUR DE PRESSION HAUTE						-KPI1		RELAIS ALARME PROTECTION INTEGRALE					
	-BHP2		TRASDUCTEUR DE PRESSION HAUTE						-KPI2		RELAIS ALARME PROTECTION INTEGRALE					
	-BLP1		TRASDUCTEUR DE PRESSION BASSE						-KSP		RELAIS ON/OFF					
F	-BLP2		TRASDUCTEUR DE PRESSION BASSE						-KWD1		-					
	-FA11		-						-KY13		RELAIS ELECTRO-VANNE					
	-FA20		FUSIBLE CARTE ELETTRONIQUE						-KY14		-					
	-FA21		FUSIBLE CARTE ELETTRONIQUE						-KY23		RELAIS ELECTRO-VANNE					
G	-FAH1		FUSIBLE TRANSFORMATEUR						-KY24		-					
	-FEV1		FUSIBLE CARTE ELETTRONIQUE						-MC1		COMPRESSEUR					
	-FEV11		-						-MC2		COMPRESSEUR					
	-FEV12		-						-MF1		VENTILATEUR					
H	-FEV2		FUSIBLE CARTE ELETTRONIQUE						-MF10		VENTILATEUR					
	-FEV21		-						-MF11		VENTILATEUR					
	-FEV22		-						-MF2		VENTILATEUR					
	-FFC1		PROTECTION DE SURCHARGE						-MF4		VENTILATEUR					
I	-FFC2		PROTECTION DE SURCHARGE						-MF5		VENTILATEUR					
	-FFC3		PROTECTION DE SURCHARGE						-MF7		VENTILATEUR					
	-FFC4		PROTECTION DE SURCHARGE						-MF8		VENTILATEUR					
	-FPI1		PROTECTION INTEGRALE						-MFEP1		PANNEAU ELECTRIQUE VENTILATEUR					
J	-FPI2		PROTECTION INTEGRALE						-MFEP2		PANNEAU ELECTRIQUE VENTILATEUR					
	-FT1		FUSIBLE TRANSFORMATEUR						-MP1		POMPE					
	-FT10		FUSIBLE TRANSFORMATEUR						-Q0		INTERRUPTEUR SECTIONNEUR					
	-FT2		FUSIBLE TRANSFORMATEUR						-QC1		INTERRUPTEUR AUTOMATIQUE COMPRESSEUR					
	-FT20		FUSIBLE TRANSFORMATEUR						-QC2		INTERRUPTEUR AUTOMATIQUE COMPRESSEUR					
	-FT21		FUSIBLE TRANSFORMATEUR						-QP1		DISJONCTEUR H.P.C. POMPE					
	-FT3		FUSIBLE TRANSFORMATEUR						-RAH1		-					
	-FT30		FUSIBLE TRANSFORMATEUR						-RAH2		-					
	-FT4		FUSIBLE TRANSFORMATEUR						-R10		-					
	-FT40		FUSIBLE TRANSFORMATEUR						-R20		-					
	-FY13		FILTRE RC						-RC1		-					
	-FY14		-						-RC2		-					
	-FY23		FILTRE RC						-REP1		RESISTANCE					
	-FY24		-						-REP2		RESISTANCE					
	-HGL1		LAMPE DE SIGNALISATION													

REV. INDEX	DATA DATE	MODIFICA MODIFICATION UNÄNDERUNG	FIRMA SIGNATURE UNTERSCHR	 MTA spa PADOVA-ITALY	PNP 280 pCO3 PUMP R134a 400/3/50 REG.EL. RES+INIEZ.	IMPIANTO-INSTALLATION-ANLAGE PNP 280 pCO3 PUMP R134a 400/3/50 REG.EL. RES+INIEZ.	NOMENCLATURA LEGENDA NOMENKLATURE NOMENKLATUR NOMENKLATURE	DESIGN-DRAFTSMAN DESSEINATEUR-ZEICHNER A. Salvo'	DATA-DATE-DATUM 17/01/2008

[illegible]

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
	SIEGEL	STELLUNG	BEZEICHNUNG					SIEGEL	STELLUNG	BEZEICHNUNG						
A	-A1		ELEKTRONISCHES PLATINE					-HRL1		SIGNALLAMPE						
	-A11		-					-KAH1		-						
	-A2		SCHEDA ELETTRONICA pCO					-KC1		VERDICHTER MOTORSCHUTZ						
	-A3		DISPLAY					-KC2		VERDICHTER MOTORSCHUTZ						
B	-A20		AUSSEN					-KC3		VERDICHTER MOTORSCHUTZ						
	-A21		AUSSEN					-KC4		VERDICHTER MOTORSCHUTZ						
	-AF1		FILTER					-KFA1		-						
	-AEV1		ELEKTRONISCHES PLATINE					-KFA2		-						
C	-AEV2		ELEKTRONISCHES PLATINE					-KFC1		-						
	-BAT1		FUHLER UMGEBUNGSTEMPERATUR					-KFC2		-						
	-BAT2		FUHLER UMGEBUNGSTEMPERATUR					-KHP1		HOCHDRUCKRELAIS						
	-BEV11		-					-KHP2		HOCHDRUCKRELAIS						
	-BEV12		-					-KOL1		-						
	-BEV21		-					-KOL2		-						
	-BEV22		-					-KP1		PUMPE SCHUTZ						
	-BEW1		VERDAMPFER EINGANG-FUEHLER					-KP1R		PUMPE RELAIS						
D	-BEWOT1		VERDAMPFER AUSGANG-FUEHLER					-KP2R		PUMPE RELAIS						
	-BHP1		HOCHWERTGEBERSDRUCK					-KP1		VOLLSCHUTZ						
	-BHP2		HOCHWERTGEBERSDRUCK					-KP2		VOLLSCHUTZ						
	-BLP1		NIEDERWERTGEBERSDRUCK					-KS01		RELAIS ON/OFF						
E	-BLP2		NIEDERWERTGEBERSDRUCK					-KSP		-						
	-FA11		-					-KWD1		-						
	-FA20		SICHERUNG					-KY13		MAGNETVENTIL RELAIS						
	-FA21		SICHERUNG					-KY14		SOLID STATE RELAIS						
F	-FAH1		TRANSFORMATOR SICHERUNG					-KY23		MAGNETVENTIL RELAIS						
	-FEV1		SICHERUNG					-KY24		SOLID STATE RELAIS						
	-FEV11		-					-MC1		KOMPRESSOR						
	-FEV12		-					-MC2		KOMPRESSOR						
G	-FEV2		SICHERUNG					-MF1		VENTILATOR						
	-FEV21		-					-MF10		VENTILATOR						
	-FEV22		-					-MF11		VENTILATOR						
	-FFC1		BI-METAL-MOTORSCHUTZ					-MF2		VENTILATOR						
H	-FFC2		BI-METAL-MOTORSCHUTZ					-MF4		VENTILATOR						
	-FFC3		BI-METAL-MOTORSCHUTZ					-MF5		VENTILATOR						
	-FFC4		BI-METAL-MOTORSCHUTZ					-MF7		VENTILATOR						
	-FP1		VOLLSCHUTZ					-MF8		VENTILATOR						
I	-FP2		VOLLSCHUTZ					-MFEP1		SCHATSCHRAK VENTILATOR						
	-FT1		TRANSFORMATOR SICHERUNG					-MFEP2		SCHATSCHRAK VENTILATOR						
	-FT10		TRANSFORMATOR SICHERUNG					-MP1		PUMP						
	-FT2		TRANSFORMATOR SICHERUNG					-Q0		LASTTRENDSCHALTER						
J	-FT20		TRANSFORMATOR SICHERUNG					-Q01		AUTOMASTICHE SCHUTZSCHALTER KOMPRESSOR						
	-FT21		TRANSFORMATOR SICHERUNG					-Q02		AUTOMASTICHE SCHUTZSCHALTER KOMPRESSOR						
	-FT3		TRANSFORMATOR SICHERUNG					-QP1		PUMPE SELBSTSCHALTER						
	-FT30		TRANSFORMATOR SICHERUNG					-RAH1		-						
	-FT4		TRANSFORMATOR SICHERUNG					-RAH2		-						
	-FT40		TRANSFORMATOR SICHERUNG					-R10		DRUCKGASUBERHITZUNGSSCHUTZ						
	-FY13		FILTER RC					-R20		DRUCKGASUBERHITZUNGSSCHUTZ						
	-FY14		VARISTOR					-RC1		-						
	-FY23		FILTER RC					-RC2		-						
	-FY24		VARISTOR					-REP1		-						
	-HGL1		SIGNALLAMPE					-REP2		-						
REV. INDEX REV.			MODIFICA MODIFICATION UMWANDLUNG		FIRMA SIGNATURE UNTERSCHR		IMPIANTO-INSTALLATION-ANLAGE		NOMENCLATURA LEGENDA		DESIGN-DRAWING DESSIN-ZEICHNUNG		DATA-DATE-DATUM		DESIGN-DRAFTSMAN DESSINATEUR-ZEICHNER	
							PNP 280 pCO3 PUMP		R134a 400/3/50 REG.EL. RES+INIEZ.		CYE0002S		17/01/2008		A.Silvo'	
															REV. INDEX	
															B	
															36 / 47	

[illegible]

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
	SIGLA	POSICION	DENOMINACION													
A	-A1		TARJETA ELECTRONICA													
	-A11		-													
	-A2		SCHEDA ELETTRONICA pCO													
	-A3		DISPLAY													
B	-A20		-													
	-A21		-													
	-AF1		-													
	-AEV1		TARJETA ELECTRONICA													
C	-AEV2		TARJETA ELECTRONICA													
	-BAT1		SONDA TEMPERATURA AMBIENTAL													
	-BAT2		SONDA TEMPERATURA AMBIENTAL													
	-BEV11		-													
D	-BEV12		TRASDUCTOR DE PRESION													
	-BEV21		-													
	-BEV22		TRASDUCTOR DE PRESION													
	-BEWIT		SONDA TEMPERATURA ENTRADA AGUA EVAPORADOR													
E	-BEWOT1		SONDA TEMPERATURA SALIDA AGUA EVAPORADOR													
	-BHP1		TRASDUCTOR DE PRESION ALTA													
	-BHP2		TRASDUCTOR DE PRESION ALTA													
	-BLP1		TRASDUCTOR DE PRESION BAJA													
F	-BLP2		TRASDUCTOR DE PRESION BAJA													
	-FA11		-													
	-FA20		FUSIBLE DE TARJETA ELECTRONICA													
	-FA21		FUSIBLE DE TARJETA ELECTRONICA													
G	-FAH1		FUSIBLE TRANSFORMADOR													
	-FEV1		FUSIBLE DE TARJETA ELECTRONICA													
	-FEV11		-													
	-FEV12		-													
H	-FEV2		FUSIBLE DE TARJETA ELECTRONICA													
	-FEV21		-													
	-FEV22		-													
	-FFC1		PROTECCION DE SUBCARGA													
I	-FFC2		PROTECCION DE SUBCARGA													
	-FFC3		PROTECCION DE SUBCARGA													
	-FFC4		PROTECCION DE SUBCARGA													
	-FPI1		PROTECCION INTEGRAL													
J	-FPI2		PROTECCION INTEGRAL													
	-FT1		FUSIBLE TRANSFORMADOR													
	-FT10		FUSIBLE TRANSFORMADOR													
	-FT2		FUSIBLE TRANSFORMADOR													
K	-FT20		FUSIBLE TRANSFORMADOR													
	-FT21		FUSIBLE TRANSFORMADOR													
	-FT3		FUSIBLE TRANSFORMADOR													
	-FT30		FUSIBLE TRANSFORMADOR													
L	-FT4		FUSIBLE TRANSFORMADOR													
	-FT40		FUSIBLE TRANSFORMADOR													
	-FY13		FILTRO RC													
	-FY14		-													
M	-FY23		FILTRO RC													
	-FY24		-													
	-HGL1		-													
	REV. INDEX REV.			DATA DATE DATUM	MODIFICA MODIFICATION UMWANDERUNG	FIRMA SIGN. UNTERSCHR	PNP 280 pCO3 PUMP R134a 400/3/50 REG.EL. RES+INIEZ.		IMPIANTO-INSTALLATION-ANLAGE DESIGN-DRAWING DESSIN-ZEICHUNG CYE0002S		NOMENCLATURA LEGENDA NOMENCLATURE NOMENKLATUR NOMENCLATURE		DESIGNATORE-DRAFTSMAN DESSINATEUR-ZEICHNER A.Salvo'	DATA-DATE-DATUM 17/01/2008		
														VISTO DA-CHECKED BY VERFIE PAR-GEPRÜFT VON <i>A. Salvo'</i>	FOLIO-SHEET FOLIO-BLATT 38 / 47	

Disegno di proprietà della M.T.A. s.p.a. che si riserva i diritti sanciti dalla legge

[illegible]

[illegible]

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
A	-																
B	SIGLA INITIALS SIGLE KENNZEICH SIGLA	POSIZIONE POSITION POSITION ORTEN POSICION	- MARCA / MODELLO - - MARKE / TYP - - BRAND / MODEL -										- MARQUE / MODELE - - MODELO - - ALTERNAT. 1 -		- ALTERNAT. 2 -		N°
	-A11	GAVAZZI	DPC01 D M48	-	-	-	-	-	-	-	-	-	-	-	-	1	
C	-FA11	WEBER	2A gG 500V (10.3x38mm)	-	-	-	-	-	-	-	-	-	-	-	-	3	
	-FA20	WEBER	PCH 3x38 cod.: 2403038	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FA21	WEBER	16A aR 500V (10.3x38mm)	-	-	-	-	-	-	-	-	-	-	-	-	3	
	-FAH1	WEBER	PCH 3x38 cod.: 2403038	-	-	-	-	-	-	-	-	-	-	-	-	1	
D	-FEV1	WEBER	16A aR 500V (10.3x38mm)	-	-	-	-	-	-	-	-	-	-	-	-	3	
	-FEV2	WEBER	PCH 3x38 cod.: 2403038	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FFC1	WEBER	PCH 3x38 cod.: 2403038	-	-	-	-	-	-	-	-	-	-	-	-	2	
	-FFC2	WEBER	4A gG 500Vac (10.3x38mm)	-	-	-	-	-	-	-	-	-	-	-	-	1	
E	-FFC3	MOELLER	Z-SH/2 art.: 263878	-	-	-	-	-	-	-	-	-	-	-	-	2	
	-FFC4	PHOENIX	UK5-HESI + 0.8A T 250V (5x20mm)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT1	PHOENIX	UK5-HESI + 0.8A T 250V (5x20mm)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT2	PHOENIX	UK5-HESI + 0.8A T 250V (5x20mm)	-	-	-	-	-	-	-	-	-	-	-	-	1	
F	-FT3	MOELLER	ZB150-125 (95÷125A) Art.: 278465	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT4	MOELLER	ZB150-125 (95÷125A) Art.: 278465	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT5	MOELLER	ZB150-125 (95÷125A) Art.: 278465	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT6	MOELLER	ZB150-125 (95÷125A) Art.: 278465	-	-	-	-	-	-	-	-	-	-	-	-	1	
G	-FT7	WEBER	4A gG 500V (10.3x38mm)	-	-	-	-	-	-	-	-	-	-	-	-	2	
	-FT8	WEBER	PCH 2x38 cod.: 2402038	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT9	WEBER	4A gG 500V (10.3x38mm)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT10	WEBER	PCH 1x38 cod.: 2402037	-	-	-	-	-	-	-	-	-	-	-	-	1	
H	-FT11	WEBER	2A gG 500V (10.3x38mm)	-	-	-	-	-	-	-	-	-	-	-	-	2	
	-FT12	WEBER	PCH 2x38 cod.: 2402038	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT13	FUSIT	4A T 250V (5x20mm)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT14	FUSIT	8A T 250V (5x20mm)	-	-	-	-	-	-	-	-	-	-	-	-	1	
I	-FT15	PHOENIX	DEK-0V-24DC/240AC/800 cod.: 2964649	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT16	PHOENIX	DEK-0V-24DC/240AC/800 cod.: 2964649	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT17	WEBER	1A gG 500V (10.3x38mm)	-	-	-	-	-	-	-	-	-	-	-	-	2	
	-FT18	WEBER	PCH 2x38 cod.: 2402038	-	-	-	-	-	-	-	-	-	-	-	-	1	
J	-FT19	PHOENIX	UK5-HESI + 0.5A T 250V (5x20mm)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT20	MOELLER	DLM7-10 230Vac	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT21	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT22	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
K	-FT23	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT24	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT25	MOELLER	DLM150-XIP2X Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT26	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
L	-FT27	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT28	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT29	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT30	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
M	-FT31	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT32	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT33	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT34	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
N	-FT35	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT36	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT37	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT38	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
O	-FT39	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT40	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT41	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT42	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
P	-FT43	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT44	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT45	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT46	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
Q	-FT47	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT48	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT49	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT50	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
R	-FT51	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT52	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT53	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT54	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
S	-FT55	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT56	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT57	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT58	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
T	-FT59	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT60	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT61	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT62	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
U	-FT63	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT64	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT65	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT66	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
V	-FT67	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT68	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT69	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT70	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
W	-FT71	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT72	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT73	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT74	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
X	-FT75	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT76	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT77	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT78	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
Y	-FT79	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT80	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT81	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT82	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
Z	-FT83	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT84	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT85	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT86	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
AA	-FT87	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT88	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT89	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT90	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
AB	-FT91	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT92	MOELLER	DLM150-XIH22 Art.:277950	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT93	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT94	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	
AC	-FT95	MOELLER	DLM115 (RAC240) Art.: 239548	-	-	-	-	-	-	-	-	-	-	-	-	1	
	-FT96	MOELLER	DLM150-XIP2X Art.: 106492 (Q.TA': 6)	-	-	-	-	-	-	-	-	-	-	-	-	1	

00		01		02		03		04		05		06		07		08		09		10		11		12		13		14		15	
SIGLA INITIALS KENNZEICH		POSIZIONE POSITION POSITION ORTEN POSICION		-- MARCA / MODELLO --		-- MARKE / TYP --		-- BRAND / MODEL --		-- MODELO --		-- MARQUE / MODELE --		N°																	
				-- STANDARD --				-- ALTERNAT. 1 --				-- ALTERNAT. 2 --																			
A	-KFA1	SCHRACK	RT425.524 (24Vac) +GZT80 +GZT80-0040 +M91R	-	-	-	-	-	-	-	-	-	-	-	1																
	-KP1	MOELLER	DILM40 (230Vac) + DILMT1000-XH11-SI	-	-	-	-	-	-	-	-	-	-	-	1																
	-KP1R	SCHRACK	RT425.730 (230Vac) +GZT80 +GZT80-0040 +M93R	-	-	-	-	-	-	-	-	-	-	-	1																
B	-KP2R	SCHRACK	RT425.730 (230Vac) +GZT80 +GZT80-0040 +M93R	-	-	-	-	-	-	-	-	-	-	-	1																
	-KP1	SCHRACK	RT425.730 (230Vac) +GZT80 +GZT80-0040 +M93R	-	-	-	-	-	-	-	-	-	-	-	1																
	-KP2	SCHRACK	RT425.730 (230Vac) +GZT80 +GZT80-0040 +M93R	-	-	-	-	-	-	-	-	-	-	-	1																
C	-KS01	SCHRACK	RT425.524 (24Vac) +GZT80 +GZT80-0040 +M91R	-	-	-	-	-	-	-	-	-	-	-	1																
	-KSP	SCHRACK	RT425.524 (24Vac) +GZT80 +GZT80-0040 +M91R	-	-	-	-	-	-	-	-	-	-	-	1																
	-KWD1	SCHRACK	RT425.524 (24Vac) +GZT80 +GZT80-0040 +M91R	-	-	-	-	-	-	-	-	-	-	-	1																
D	-KY13	SCHRACK	RT425.024 (24Vdc) +GZT80 +GZT80-0040 +M41R	-	-	-	-	-	-	-	-	-	-	-	1																
	-KY23	SCHRACK	RT425.024 (24Vdc) +GZT80 +GZT80-0040 +M41R	-	-	-	-	-	-	-	-	-	-	-	1																
	-KFA2	SCHRACK	RT425.524 (24Vac) +GZT80 +GZT80-0040 +M91R	-	-	-	-	-	-	-	-	-	-	-	1																
E	-KFC1	SCHRACK	RT425.730 (230Vac) +GZT80 +GZT80-0040 +M93R	-	-	-	-	-	-	-	-	-	-	-	1																
	-KFC2	SCHRACK	RT425.730 (230Vac) +GZT80 +GZT80-0040 +M93R	-	-	-	-	-	-	-	-	-	-	-	1																
	-KHP1	SCHRACK	RT425.730 (230Vac) +GZT80 +GZT80-0040 +M93R	-	-	-	-	-	-	-	-	-	-	-	1																
F	-KHP2	SCHRACK	RT425.730 (230Vac) +GZT80 +GZT80-0040 +M93R	-	-	-	-	-	-	-	-	-	-	-	1																
	-KOL1	SCHRACK	RT425.730 (230Vac) +GZT80 +GZT80-0040 +M93R	-	-	-	-	-	-	-	-	-	-	-	1																
	-KOL2	SCHRACK	RT425.730 (230Vac) +GZT80 +GZT80-0040 +M93R	-	-	-	-	-	-	-	-	-	-	-	1																
G	-QC1	MOELLER	NZM2-A250 Art.: 259090	-	-	-	-	-	-	-	-	-	-	-	1																
	-QC2	MOELLER	NZM2-A250 Art.: 259090	-	-	-	-	-	-	-	-	-	-	-	1																
	-Q0	SOCOME	SIRCO 3x630A Art.: 26003064	-	-	-	-	-	-	-	-	-	-	-	1																
H	-T1	WOHNER	P=800VA Pri=400Vac Vsec.: 230Vac	-	-	-	-	-	-	-	-	-	-	-	1																
	-T2	BOTTIER/FMT	P=300VA Pri=400V	-	-	-	-	-	-	-	-	-	-	-	1																
	-T3	BOTTIER	P=12VA Pri=400V Vsec.=24V	-	-	-	-	-	-	-	-	-	-	-	1																
I	-U1	PHOENIX	MINI-PS-100-240AC/24DC/1 cod.: 2938840	-	-	-	-	-	-	-	-	-	-	-	1																
	-X11-X23	ENTRELEC	-	-	-	-	-	-	-	-	-	-	-	-	-																
	-X11-X12	PHOENIX	-	-	-	-	-	-	-	-	-	-	-	-	-																
J																															
REV. INDEX		MODIFICA MODIFICATION UNÄNDERUNG		FIRMA SIGN. UNTERSCHR		IMPIANTO-INSTALLATION-ANLAGE PNP 280 pCO3 PUMP R134q 400/3/50 REG.EL. RES+INIEZ.		DISP. ELETTRICI PER TUTTI I MODELLI ELECTRICAL DEVICES FOR ALL MODELS DISP. ELEC. POUR TOUS MODELE GREATEN DISP. ELEC. PAR TODOS MODELOS		DISEGNO-DRAWING DESSIN-ZEICHNUNG CYE00002S		DISEGNATORE-DRAFTSMAN DESSINAUTEUR-ZEICHNER A.Solivo'		DATA-DATE-DATUM 17/01/2008																	
												VISTO DA-CHECKED BY VERIFIE PAR-GEPRÜFT VON M. Merida		FOLIO-SHEET FOLIO-BLATT 43 / 47																	

Disegno di proprietà della M.T.A. s.p.a. che si riserva i diritti sanciti dalla legge

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
DISPOSITIVI COMUNI A TUTTI I MODELLI -- DEVICES FOR ALL MODELS																
A	SIGLA INITIALS SIGLE KENNZEICH SIGLA	POSIZIONE POSITION POSITION ORTEN POSICION	-- MARCA / MODELLO --		-- MARKE / TYP --		-- BRAND / MODEL --		-- MODELO --		-- MARQUE / MODELE --		N°			
			-- STANDARD --		-- ALTERNAT. 1 --		-- ALTERNAT. 2 --									
B	-A1	CAREL	SCHEDE ELETTRONICA pCO ³ -- MASTER		-		-		-		-		1			
	-A2	CAREL	SCHEDE ELETTRONICA pCO ³ -- SLAVE		-		-		-		-		1			
C	-A3	CAREL	DISPLAY GRAFICO PGD1000F00		-		-		-		-		1			
	-A20	FAE	VRTMS12		-		-		-		-		1			
D	-A21	FAE	VRTMS12		-		-		-		-		1			
	-AF1	CAREL	FILTRO DI RETE cod. 0907930AXX		-		-		-		-		1			
E	-AEV1	CAREL	EVD0000200		-		-		-		-		1			
	-AEV2	CAREL	EVD0000200		-		-		-		-		1			
F	-BAT1		SONDA NTC** IP68		-		-		-		-		1			
	-BAT2		SONDA NTC** IP68		-		-		-		-		1			
G	-BEV11	DIXELL	NT6-67 (-50°C ± +120°C)		-		-		-		-		1			
	-BEV12	KELLER	PA 21M/80401.11 10b		-		-		-		-		1			
H	-BEV21	DIXELL	NT6-67 (-50°C ± +120°C)		-		-		-		-		1			
	-BEV22	KELLER	PA 21M/80401.11 10b		-		-		-		-		1			
I	-BEW1		SONDA NTC** IP68		-		-		-		-		1			
	-BEW1T1		SONDA NTC** IP68		-		-		-		-		1			
J	-BHP1	CAREL	SPKT0033R0 (0÷34bar)		-		-		-		-		1			
	-BHP2	CAREL	SPKT0033R0 (0÷34bar)		-		-		-		-		1			
	-BLP1	CAREL	SPKT0033R0 (0÷34bar)		-		-		-		-		1			
	-BLP2	CAREL	SPKT0033R0 (0÷34bar)		-		-		-		-		1			
	-FEV11	CAREL	TOROIDE cod 0907858AXX		-		-		-		-		1			
	-FEV12	CAREL	TOROIDE cod 0907858AXX		-		-		-		-		1			
	-FEV21	CAREL	TOROIDE cod 0907858AXX		-		-		-		-		1			
	-FEV22	CAREL	TOROIDE cod 0907858AXX		-		-		-		-		1			
	-RAH1	HEATING ITALIANA	R=350W 400Vac/1Ph/50Hz		-		-		-		-		1			
	-RAH2	HEATING ITALIANA	R=350W 400Vac/1Ph/50Hz		-		-		-		-		1			
	-S1HP1	DANFOSS	KP7W AUT. (18 - 13Barg)		-		-		-		-		1			
	-S2HP1	DANFOSS	KP7S MAN. (18.5 - 14.5Barg)		-		-		-		-		1			
	-S1HP2	DANFOSS	KP7W AUT. (18 - 13Barg)		-		-		-		-		1			
	-S2HP2	DANFOSS	KP7S MAN. (18.5 - 14.5Barg)		-		-		-		-		1			
	-SFEV1	PRODIGY	F2000 +30°C / +90°C		-		-		-		-		1			
	-SWD1	TOVO	SFS		-		-		-		-		1			
	-ST1	DANFOSS	KP81A		-		-		-		-		1			
	-ST2	DANFOSS	KP81A		-		-		-		-		1			

REV	INDEX	DATA	DATE	DATUM	MODIFICA MODIFICATION UMÄNDERUNG	FIRMA SIGN. UNTERSCHR	IMPIANTO-INSTALLATION-ANLAGE PNP 280 pCO3 PUMP R134a 400/3/50 REG.EL. RES+INIEZ.		DISP. ELETTRICI PER TUTTI I MODELLI ELECTRICAL DEVICES FOR ALL MODELS DISP. ELEC. POUR TOUS MODELE GRETEN DISP. ELEC. PAR TODOS MODELOS		DESIGNATORE-DRAFTSMAN DESSINATEUR-ZEICHNER A.Silvo'	DATA-DATE-DATUM 17/01/2008
							DESIGN-DRAWING DESSIN-ZEICHNUNG CYE0002S				VISTO DA-CHECKED BY VERIFIE PAR-GEPRÜFT VON <i>M. Mordin</i>	FOLIO-SHEET FOLIO-BLATT 45 / 47

Disegno di proprietà della M.T.A. s.p.a. che si riserva i diritti sanciti dalla legge

00		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
СОКРАЩЕНИЕ		ПОЛОЖЕНИЕ		НАЗВАНИЕ												
-A1		ЭЛЕКТРОСХЕМА														
-A1.1		РЕЛЕ КОНТРОЛИ ФАЗ														
-A2		ЫСУВНО-УДРЕКШПШФ-АЩ														
-A3		ДШПШ														
-A20		РЕГУЛЯТОР СКОРОСТИ ВЕНТИЛЯТОРОВ														
-A21		РЕГУЛЯТОР СКОРОСТИ ВЕНТИЛЯТОРОВ														
-AF1		ФШПШР														
-AEV2		ЭЛЕКТРОСХЕМА														
-BAT1		ДАТЧИК ТЕМПЕРА ОЖР СРЕДЫ														
-BAT2		ДАТЧИК ТЕМПЕРА ОЖР СРЕДЫ														
-BEV11		ТЕМПЕРАТУРНЫЙ ДАТЧИК														
-BEV12		РЕГУЛЯТОР ДАВЛЕНИЯ														
-BEV21		ТЕМПЕРАТУРНЫЙ ДАТЧИК														
-BEV22		РЕГУЛЯТОР ДАВЛЕНИЯ														
-BEWIT		ДАТЧИК ТЕМПЕРАТУРЫ ВОДЫ НА ВХОДЕ В ИСПАРИТЕЛЬ														
-BEWOT1		ДАТЧИК ТЕМПЕРА ВОДЫ НА ВЫХОДЕ ИЗ ИСПАРИТЕЛЯ														
-BHP1		РЕГУЛЯТОР ВЫСОКОГО ДАВЛЕНИЯ														
-BHP2		РЕГУЛЯТОР ВЫСОКОГО ДАВЛЕНИЯ														
-BLP1		РЕГУЛЯТОР НИЗКОГО ДАВЛЕНИЯ														
-BLP2		РЕГУЛЯТОР НИЗКОГО ДАВЛЕНИЯ														
-FA11		ПРЕДОХРАНИТЕЛЬ ФАЗОВОГО МОНИТОРИНГА														
-FA20		ПРЕДОХРАНИТЕЛЬ ЭЛЕКТРОННОЙ СХЕМЫ														
-FA21		ПРЕДОХРАНИТЕЛЬ ЭЛЕКТРОННОЙ СХЕМЫ														
-FAH1		ПРЕДОХРАНИТЕЛЬ ТРАНСФОРМАТОРА														
-FEV1		ПРЕДОХРАНИТЕЛЬ ЭЛЕКТРОННОЙ СХЕМЫ														
-FEV11		ФЕРРИТНЫЙ ТОР														
-FEV12		ФЕРРИТНЫЙ ТОР														
-FEV2		ПРЕДОХРАНИТЕЛЬ ЭЛЕКТРОННОЙ СХЕМЫ														
-FEV21		ФЕРРИТНЫЙ ТОР														
-FEV22		ФЕРРИТНЫЙ ТОР														
-FFC1		ТЕРМОЗАЩИТА														
-FFC2		ТЕРМОЗАЩИТА														
-FFC3		ТЕРМОЗАЩИТА														
-FFC4		ТЕРМОЗАЩИТА														
-FPI1		РЕЛЕ БЕЗОПАСНОСТИ														
-FPI2		РЕЛЕ БЕЗОПАСНОСТИ														
-FT1		ПРЕДОХРАНИТЕЛЬ ТРАНСФОРМАТОРА														
-FT10		ПРЕДОХРАНИТЕЛЬ ТРАНСФОРМАТОРА														
-FT2		ПРЕДОХРАНИТЕЛЬ ТРАНСФОРМАТОРА														
-FT20		ПРЕДОХРАНИТЕЛЬ ТРАНСФОРМАТОРА														
-FT21		ПРЕДОХРАНИТЕЛЬ ТРАНСФОРМАТОРА														
-FT3		ПРЕДОХРАНИТЕЛЬ ТРАНСФОРМАТОРА														
-FT30		ПРЕДОХРАНИТЕЛЬ ТРАНСФОРМАТОРА														
-FT4		ПРЕДОХРАНИТЕЛЬ ТРАНСФОРМАТОРА														
-FT40		ПРЕДОХРАНИТЕЛЬ ТРАНСФОРМАТОРА														
-FY13		ФШПШ КС														
-FY14		ФШПШ КС														
-FY23		ФШПШ КС														
-FY24		ФШПШ КС														
-HGL1		СИГНАЛЬНАЯ ЛАМПОЧКА														

00		01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
СОКРАЩЕНИЕ		ПОЛОЖЕНИЕ		НАЗВАНИЕ												
-HRL1		СИГНАЛЬНАЯ ЛАМПОЧКА														
-KAH1		РЕЛЕ ЗАПАСКА ТЭНА														
-KC1		КОНТАКТОР КОМПРЕССОРА														
-KC2		КОНТАКТОР КОМПРЕССОРА														
-KC3		КОНТАКТОР КОМПРЕССОРА														
-KC4		КОНТАКТОР КОМПРЕССОРА														
-KEA1		РЕЛЕ АВАРИЙНОГО СИГНАЛА ВЕНТИЛЯТОРОВ														
-KEA2		РЕЛЕ АВАРИЙНОГО СИГНАЛА ВЕНТИЛЯТОРОВ														
-KFC1		РЕЛЕ ТЕРМОЗАЩИТЫ КОМПРЕССОРА														
-KFC2		РЕЛЕ ТЕРМОЗАЩИТЫ КОМПРЕССОРА														
-KHP1		РЕЛЕ АВАРИЙНОГО СИГНАЛА ПО ВЫСОКОМУ ДАВЛЕНИЮ														
-KHP2		РЕЛЕ АВАРИЙНОГО СИГНАЛА ПО ВЫСОКОМУ ДАВЛЕНИЮ														
-KOL1		РЕЛЕ ПОДСАКОВОГО ДАТЧИКА УРОВНЯ МАСЛА														
-KOL2		РЕЛЕ ПОДСАКОВОГО ДАТЧИКА УРОВНЯ МАСЛА														
-KPI		КОНТАКТОР НАСОСА														
-KPIR		РЕЛЕ НАСОСА														
-KR2R		РЕЛЕ НАСОСА														
-KPI1		РЕЛЕ														
-KPI2		РЕЛЕ														
-KS01		РЕЛЕ ПУШПАА														
-KSP		РЕЛЕ ВЫБОРА НАСТРОЕК /НАСТРОЕК 2														
-KWD1		РЕЛЕ ДИФФЕРЕНЦИАЛЬНОГО ДАВЛЕНИЯ														
-KY13		РЕЛЕ ЭЛЕКТРОКЛАПАНА														
-KY14		ТВ РАБОТНОЕ РЕЛЕ														
-KY23		РЕЛЕ ЭЛЕКТРОКЛАПАНА														
-KY24		ТВ РАБОТНОЕ РЕЛЕ														
-MC1		КОМПРЕССОР														
-MC2		КОМПРЕССОР														
-MF1		ВЕНТИЛЯТОР														
-MF10		ВЕНТИЛЯТОР														
-MF11		ВЕНТИЛЯТОР														
-MF2		ВЕНТИЛЯТОР														
-MF4		ВЕНТИЛЯТОР														
-MF5		ВЕНТИЛЯТОР														
-MF7		ВЕНТИЛЯТОР														
-MF8		ВЕНТИЛЯТОР														
-MEP1		ВЕНТИЛЯТОР ЭЛЕКТРОПШТА														
-MEP																

[illegible]